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Technical Report 870

Comparison of Retention Patterns for Army National Guard and Army Reserve Units Participating in National Training Center, Reforger and Blazing Trails Exercises

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January 1990

United States Army Research Institute for the Behavioral and Social Sciences

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This study compares attrition in National Guard and Army Reserve units attending National Training Center (NTC), Reforger and Blazing Trails exercises (Central America), with control units not attending NTC. Attrition is identified by following those individuals present 12 months before the exercise to 6 months following the exercise. Longer-term attrition trends are also presented for these individuals through the end of FY86. Statistical attrition models are estimated using the logit functional form to control for effects of different personnel composition among units. The statistical analysis is supplemented by case studies of units to identify causes of attrition. The results show that National Training Center units have higher attrition results, but not Reforger or Blazing Trails units. Attrition rates are approximately 25% higher in National Training Center units than control units. Attrition rates in Reforger and Blazing Trails units are less than 5% higher than control units. The case studies identified four causes of increased attrition: lost civilian income, employer conflict, family conflict, and marginal performance. An
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associated survey strongly supported the hypothesis of lost income and employer support, and weakly supported family conflict and marginal performance. National Training Center exercises demand a longer and more intense period of trainup followed by 3 weeks of annual training. In addition, individuals train more intensely at the National Training Center and are less able to resume normal civilian and family activities. In contrast, Reforger and Blazing Trails exercises at NTC usually do not require extra training and demand only 17 days of annual training.

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FOREWORD

The retention team of the Personnel Utilization Technical Area performed this research on the impact of extended annual training exercises on Reserve and National Guard attrition as part of the continuing commitment of the Army Research Institute for the Behavioral and Social Sciences (ARI) to understanding the dynamics of retention and attrition from the total Army perspective.

The purpose of this study is to establish whether Army National Guard and Army Reserve Units attending the National Training Center (NTC), Reforger and Blazing Trails Exercises, have higher attrition levels than similar units not attending NTC, and to ascertain the reasons for differences in attrition levels. A three-pronged approach was used: (1) a large-scale survey of units, (2) an analysis of statistical data from the Defense Manpower Data Center (DMDC), and (3) selected case studies of units.

The research reported here was requested of the Army Research Institute by the Assistant Deputy Chief of Staff for Personnel, Department of the Army. The results have been briefed to the Deputy Assistant Secretary of Defense; the Deputy Chief of Staff for Personnel, Department of the Army; the Deputy Commander, Training and Doctrine Command (TRADOC); the Deputy Chief of Staff for Personnel, U.S. Armed Forces Command (FORSCOM); the Director, Army National Guard Bureau; and the Adjutant General, State of Georgia.

EDGAR M. JOHNSON
Technical Director

COMPARISON OF RETENTION PATTERNS FOR NATIONAL GUARD AND ARMY RESERVE UNITS PARTICIPATING IN NATIONAL TRAINING CENTER, REFORGER AND BLAZING TRAILS EXERCISES

EXECUTIVE SUMMARY

Requirement:

The purpose of this study is to establish whether Army National Guard and Army Reserve Units attending the National Training Center (NTC), Reforger and Blazing Trails Exercises, have higher attrition levels than similar units not attending NTC, and to ascertain the reasons for differences in attrition levels.

Procedure:

The research was carried out through case studies of selected units and statistical analysis of computerized personnel data from the Defense Manpower Data Center (DMDC). The case studies were performed through visits to each of five units where interviews were conducted. These visits usually occurred within 1 year following the exercise rotation. A typical visit was made during a weekend when units were drilling, and separate interviews were held with the unit commander, unit officers, NCO's, and junior enlisted personnel.

The statistical analysis developed attrition models for NTC, Reforger and Blazing Trails, and comparable control units for the period starting 1 year prior to NTC to 6 months after NTC. These models were developed by matching personnel records for these two time periods to determine which individuals were present and which separated. Logistic models were fit to this individual data to control for differences in attrition between different groups and to test for the presence of statistically significant differences in attrition between exercise units and control unit personnel. Tests were also run to determine which types of personnel suffered the largest differences in attrition for exercise and control units.

Findings:

The results show that both attrition from the unit and from the Guard is higher among reservists participating in NTC training than among reservists in comparable units not attending NTC. For the shorter 18-month period (12 months prior to NTC to 6 months after), attrition from NTC units was 30.0 percent compared to 22.6 percent for comparable non-NTC units. For attrition out of the Guard, the corresponding rates are 25.5 percent for NTC units and 19.6 percent for non-NTC units. This represents a 33 percent increase in unit attrition and a 30 percent increase in Guard attrition potentially attributable to NTC training.

For Reforger units, unit attrition was 28.4 percent compared to 26.7 percent for corresponding control units. For Blazing Trails units, unit attrition was 31.5 percent compared to 30.6 percent for control units. These units had only slightly higher attrition rates as a result of exercise participation. The difference in attrition is probably attributable to the longer and more intense period of trainup for NTC units, and the more intense 3-week annual training period.

Our results show that the additional attrition effects for NTC unit personnel were broadly spread among all types of reservists. Our statistical analysis shows that--other things equal--attrition in NTC units was higher for virtually every subgroup tested. The only group that seems to have an unusually high attrition effect are lower quality personnel (category IV and/or high school dropouts). This would support the hypothesis that at least a portion of the attrition may be due to loss of marginal performers.

There are four hypotheses for higher levels of unit attrition that arise both from previous research and from the case studies.

- The additional training time required for NTC causes family conflict leading to separation or transfer.
- The additional training time required for NTC causes employer problems leading to transfer or separation.
- The additional training time causes increased loss of income, vacation time, or increased threat of job dismissal.
- Tighter physical conditioning, performance, or attendance standards are imposed in preparation for NTC leading to transfer or separation of marginal performers.

Survey data collected in conjunction with this work show strong evidence that civilian job conflict and loss of civilian income were the strongest differential reasons for leaving between exercise and control unit personnel.

Utilization of Findings:

Results of this research have been briefed to the Director, National Guard Bureau and several offices in the National Guard Bureau and Army Deputy Chief of Staff for Personnel. These results are also being used to support recommendations for reserve compensation changes to the Sixth Quadrennial Review of Military Compensation.

COMPARISON OF RETENTION PATTERNS FOR NATIONAL GUARD AND ARMY RESERVE UNITS PARTICIPATING IN NATIONAL TRAINING CENTER, REFORGER AND BLAZING TRAILS EXERCISES

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I. INTRODUCTION

COMPARISON OF RETENTION PATTERNS FOR ARMY NATIONAL GUARD AND ARMY RESERVE UNITS PARTICIPATING IN NATIONAL TRAINING CENTER, REFORGER AND BLAZING TRAILS EXERCISES

Several initiatives have been undertaken to raise the personnel and training readiness of the Army National Guard. These initiatives include providing improved weapons and training equipment, increased levels of full time manning, increased pay and benefits in the form of enlistment and reenlistment bonus payments and improved G.I. Bill educational benefits, and improved training opportunities. The training opportunities include more participation in European(REFORGER) mobilization exercises, participation in combat training at the National Training Center (NTC), and construction and logistics exercises in Central America(BLAZING TRAILS).

Successful preparation and execution of these exercises means that reserve unit personnel put in additional training time. For NTC rotations, additional unit training time is required for the year long trainup in preparation, and three weeks of annual training rather than the normal two weeks is required. In addition some unit members--mostly officer and senior NCO personnel--put in additional weekend time and stay longer than three weeks at NTC. Reforger exercises usually require three weeks of annual training, but do not require as intensive period of trainup. Rotations in Central America usually require less than three weeks of annual training, and little extra unit training time in preparation. In addition, the Reforger and Blazing Trails exercises are less intensive than NTC, and unit members return better able to resume civilian jobs and family life.

The differing time and training intensity required among these exercises and between these units and units participating in regular unit training forms a "natural" experiment to test hypothesis regarding the effects of additional training time on unit attrition. Increasing the time required of reservists will almost certainly lower retention levels as members encounter more conflicts with employers and families and their own leisure time needs. Previous research has established that conflicts with families and employers are the two primary reasons why Guardsmen and Reservists leave the reserve. In addition, a previous study (Grissmer and Nogami, 1988) revealed that additional reserve training time results in negative wage rates for many reservists due to lost civilian income. Thus, adding training time for drills on annual training often reduces a reservists annual income, and often forces a reservist to use normal vacation time for attendance. These losses can also lower retention rates. Thus, increased training time might--other things equal--increase training readiness and mission proficiency, but at the cost of reduced retention and perhaps unit strength.

A previous study, results of which are reported in Grissmer and Nogami (1988), was carried out through case studies for the first seven National Guard units to attend NTC, and a statistical analysis of loss data which compared data from these units and comparable control units. It analyzed attrition data from the first seven units to attend NTC. It concluded that attrition rates increased for NTC units by about 25 percent over comparable units not attending NTC. It attributed the increases to four causes:

- forced separation of marginal performers prior to NTC
- increased employer conflicts due to additional training time
- increased family conflicts due to increased training time
- loss of civilian income due to additional training time

The study was unable to determine how much each of the causes contributed to the additional attrition.

The results of the first study provoked sufficient interest that a second broader study was undertaken. The second study attempted to answer several questions concerning possible increases in personnel attrition connected to NTC, Reforger and Blazing Trails participation. These were:

- Whether NTC, Reforger and Blazing Trails units experienced higher than normal levels of attrition.
- Whether these losses could be attributed to Exercise participation.
- Whether the loss patterns were different for the three Exercises.
- Whether these different patterns could be attributable to personnel policies of each unit or other economic and external circumstances connected with each rotation.
- Whether losses could be traced to specific family or employer conflicts, loss of civilian income or forced separation of marginal performers, or other causes.

This study substantially broadened the earlier study in several ways. First, it included reserve units in Reforger and Blazing Trails exercises as well as NTC. Second, it added one additional NTC unit to the analysis as well as another year of long term data for all NTC units. Third, an extensive companion survey effort was undertaken to determine reasons for attrition for those individuals who left reserve units during the exercise period. These surveys were given to supervisors and peers of individuals who left exercise or control units during the 12 months prior to an exercise or 6 months after the exercise. Fourth, the statistical attrition models were estimated to determine attrition patterns before and after the exercise. These models could

shed light on the question whether higher attrition was due to pruning of marginal performers prior to the exercise.

Work under this contract supported the design of the new study, the specification and identification of samples of individuals to be surveyed, the estimation of attrition models for all units, and help in the survey design and interpretation of survey results. In addition, it partially supported case studies of several units participating in NTC, Reforger and Blazing Trails. In this report we present results of case studies, attrition models and some results from the surveys. More extensive analysis of the survey data is given in another report (Nogami, et al., June 1988).

The methodology for the study follows and extends that of the earlier study. It includes case studies of units undergoing these exercises, and statistical attrition models of NTC, Reforger and Blazing Trails and comparable units located in the same states, and partial analysis of the survey data. The importance of this study lies in the fact that it is both a continuation and an extension of the previous work: this allows us to place the NTC experience in a broader context and to examine the experience of units undergoing similar exercises to see to what extent the NTC retention patterns are replicated. This should help answer crucial training readiness policy questions regarding (1) the feasibility of increased training time as an option to increase training readiness; (2) the problems associated with particular types of training; and (3) the need for special solutions either in terms of increased compensation or other concomitant changes.

Chapter two summarizes results from the case studies, and chapter three presents the results of the statistical models for NTC, Reforger and Blazing Trails units. Chapter four presents results from attrition models for each state, while Chapter five presents results from the survey and from models of the timing of attrition. Chapter six presents our conclusions.

II. CASE-STUDIES

DESCRIPTION (RESERVE SIGNAL UNIT--JUNCTION CITY, WISCONSIN)

Unit

This unit is a Army Reserve Signal Company which participated in Blazing Trails in July 1987. Its function is to support a Theatre size operation in the event of a conflict. This unit is headquartered in Junction City, Wisconsin. Within a 30 mile radius of this Reserve unit, there are at least five other Reserve and National Guard units (at Marshfield, Mosinee, Wausau, Wisconsin Rapids, and Stevens Point).

In the past few years, this unit has had the following Annual Training schedule:

Gallant Eagle in California, 1984
FT Pickett or Bright Star in Egypt, 1985 (split training)
FT Bragg, NC in 1986 (unit went in two increments)
Blazing Trails and FT McCoy, WI, in 1987.

As evident in the schedule above, the unit had not trained as a unit since Gallant Eagle in 1984.

Personnel

This unit is authorized to be at 125 percent strength. At the time of the interviews the unit had approximately 125 members, it was at 90 percent strength. It was estimated that the unit strength was approximately the same just before the Blazing Trails exercise. The NCOs report that there are also vacant positions within this unit.

Many unit members work in the paper mills in nearby towns, or on small family-owned farms in the area. In addition, the unit recruits many students from nearby universities and colleges. Some of the reasons for joining the unit are to see the country, to pay off school expenses, to earn extra money, and for the camaraderie.

The personnel composition of this unit is, to a large degree, determined by the function and location of the unit. This is the only Signal CO in Wisconsin. For those trained in signal MOS, there is no other Reserve unit for them. Consequently, a number of the unit members travel substantial distances to attend training. For the Officers and NCOs, in particular, 100 mile drives each way or more were not uncommon.

EXERCISE

Preparation

The 410th was not originally scheduled to participate in Blazing Trails. An Ohio unit pulled out of the exercise in September 1986 and the 416th Engineer Battalion in Chicago, IL, was put in as a replacement with the 410th Signal Company in support. All planning began in September, leading to a very short planning period. This short timeline required a lot of scambling and long nights for the NCOs and Officers, according to those interviewed. Some additional training was required, but apparently, this was not a major burden on the unit.

The Company Commander recalls that he was notified of his unit's December 1986 - May 1987 participation in Blazing Trails in August or September 1986. In October the troops were given tentative dates for participation, but official troop notification was not accomplished before November. This late notification was in compliance of a Task Force 364 decision to keep the exact dates of participation secret until November.

The late notification caused several problems for the Reservists. Late notification of employers and the resultant civilian employment accomodations were more difficult than would have been expected with earlier notification. Some of the media tried to portray the exercise as "going to war". With little other information forthcoming from the unit or the Task Force until a month before deployment, families were exceedingly apprehensive.

Although these problems were noted, "everyone" in the unit wanted to go on the exercise. They all "looked forward to it" because it was going to be "real life" and it was different from their normal AT at Ft McCoy.

There were no additional MUTA's for the entire unit. However, individuals within the unit may have had additional training weekends or MUTA's. This was especially ture for those who needed to be qualified on their equipment before going to Honduras. Some additional training was necessary for the teletype operators, and logistic preparations took considerable planning on the part of the Officers and NCOs.

EXECUTION

The last unit rotation to Blazing Trails returned on 30 May 1987. These rotations were generally 17 days in duration. In addition to the advance party involved with the initial organization, there were 10 rotations. Between 2 and 20 soldiers from this unit were involved in any one rotation. When needed, fillers came from other units or were the full-time manning people within the unit.

With 10 rotations to Honduras, it was easy to accomodate individual Reservists' schedules. Many of the college and university students and teachers elected to take an early rotation which fit into their Winter break and not require them to miss any classes.

Some of the NCOs and Officers felt that Blazing Trails really required a Division-level or Battalion-level signal company. They felt that sending a Theatre-size signal company was outside the scope of the unit mission.

The Company Commander stated that although the tasks accomplished during Blazing Trails was not entirely within the mission scope of the unit, it was the best Annual Training "I have ever witnessed" and the unit "got more out of it than I expected". There was general agreement among the Officers, NCOs, and Junior Enlisted that the "real-life" training was excellent. They felt they were doing a real mission, and had the support that they would have in an actual deployment.

There appeared to be many reasons for this positive assessment. First, the soldiers were able to train using equipment in "real life". The soldiers thought that there was significant value to actual field exercises. This was contrasted to their normal AT at FT McCoy. Second, they felt they were doing something valuable for other people who appreciated their efforts. Third, the conditions in the field challenged the soldiers, particularly in repairing equipment and coping with whatever equipment was available. One NCO was especially proud of his newly found ability to cope with adversity and "jerry-rigging" equipment to work. Fourth, the cross-training was especially valuable. Some in the unit learned new skills on new equipment.

The Officers and NCOs felt that the training would have been even more useful if they had gone as a unit. In this sense, the exercise was thought to provide good individual troop training. This lack of unit training and the importance of unit training was emphasized repeatedly in the Officer and NCO interviews, although it did not appear to be a factor for the Junior Enlisted. There is some substantial Officer and NCO sentiment that the "fragmented" training has led to unit morale problems (e.g., lower esprit de corps and has hurt retention and recruiting), but has not hurt training or readiness. However, they were not able to attribute losses specifically to Blazing Trails.

There were several other drawbacks to the training exercise in Honduras. One major problem appeared to be with equipment. Some of the signal equipment were reported to be inappropriate for Honduras because the necessary air conditioning to keep these equipment running properly were not available. Consequently, much of the equipment overheated and would be shut down for periods of time. Simple things like teletype ribbons and the developing cassettes for copying machines were unavailable or very limited.

Repair parts were in short supply and, in many cases, had to be ordered from the U.S. with the resultant time lag. Some parts reportedly did not arrive until near the end of the exercise, which left the unit with less than adequate coverage. Repair parts were not the only problem: there was also inadequate medical supplies which adversely affected at least one of the troops interviewed.

This unit (the 410th) went to Blazing Trails in a support capacity to the 416th. Consequently, all actions, travel orders, supplies, etc. were filtered through the commanding unit to this Reserve unit. This led to many instances of mis-communication. For example, the unit was informed that soldiers could go to Blazing Trails for the entire rotation of 179 days. Some Reservists decided to do this and made the necessary arrangements with employers and families. Some Reservists quit their jobs and some students did not register for one semester. When they arrived in Honduras, some were informed that they were not needed for more than the one increment and were sent back after one increment. Others were given the option of returning every other incremental rotation. This arrangment imposed both financial, as well as personal hardship on the troops. This rotating door policy (of alternate increments) was apparently initiated in an effort to shift from ADT funds (paid for by the Task Force) to unit AT funds.

After unit personnel were assigned to the different rotations, orders were cut, and unit manifests were completed. The soldiers were sent to FT Sheridan for transport to Honduras. Approximately 15-20 Junior Enlisted who had received orders and arrived at the airport were denied passage only four hours before departure, apparently because too many soldiers (including fillers from other units) had been inadvertently scheduled. The unit manifests did not match the plane manifests. The individuals denied participation in the exercise were put in a difficult position, having already made plans with employers and families. Most of this lack of coordination was attributed to the Fourth Army.

"Fillers" for the exercise came from other Reserve units in Wisconsin, Illinois, Indiana and Iowa. The unit had very limited information on the fillers. Until they arrived in FT Sheridan, they did not know the numbers, security clearances, MOS qualifications or MOS of the Fillers. According to one account, over 50 percent of the fillers wre not MOS qualified, although that was a requirement. Despite these problems, they returned with the feeling of accomplishment that although they didn't know each other, they could still work together effectively under adverse conditions--no small feat.

Many of the interviewees cited coordination problems while in Honduras. They reported a lack of coordination between the base camp and the air base in Palmerola, between the Task Force, the unit and in-country personnel, and between the Task Force, the 416th and their unit. Supply lines were a problem because the staff weren't coordinated. In addition, there appeared to be some in-fighting for control. Several of the Junior Enlisted complained about the high ratio of Officers to Enlisted during the last rotation.

Amenities and living conditions while in Honduras were less than desirable. For example, the enlisted personnel found it hard to understand why, in the middle of the jungle and on base, they were required to wear full uniform. Shorts were only permitted while the troops were within their tents. Even when walking between tents within the base camp, civilian clothing was not allowed. The group felt that numerous new rules that served no real purpose were made by the Officers on base. The constantly changing rules negatively affected this unit's morale.

Some enlisted reported working up to 12 hours a day (in the early increments). Faced with that schedule and the unrelenting heat, the short hours for showers and meals were a disamenity. The soldiers from this unit were also not allowed off the base camp. What was particularly galling to these soldiers is that the communications unit let their Reservists out at least once a day. At times, it seemed to the troops that the Officers frowned on all amusement. This applied, in particular, to socializing among soldiers of different sexes. Additionally, women soldiers felt that they had been harrassed by the Officers, and were not totally welcome.

Recovery

One unexpected effect of the unit's participation in Blazing Trails is an "appreciation of the United States". The poverty they observed in Honduras provoked sympathy for the people of the country. One nearby community coordinated a charity drive for funds for Honduras.

The Enlisted thought that the unit's participation in Blazing Trails was good for public relations for the unit, and would have a beneficial impact on recruiting. They felt that the travel and adventure would appeal to their friends and peers. However, no observable increase in recruiting was noted by either the NCO's or Officers in this unit. The exercise, per se, was thought to have a slightly negative impact for several reasons. The segmented training, repeating a pattern over the last several years, reduced the cohesion felt by members of the unit. According to the Officers, the sense of belonging to a group is very important for both recruiting and retention in this unit. To the extent that the unit does not train together as a whole, that group identity is difficult to foster.

Based upon their experience at Blazing Trails, the Junior Enlisted felt that they would be able to, and would like to go on extended annual training exercises every year--as long it was "someplace different" than FT McCoy. The NCOs and Officers felt that a schedule of extended annual training every three years was optimal, as long as the entire unit went.

CIVILIAN EMPLOYER ISSUES

The Junior Enlisted feel that employers are not strong supporters of the Reserve unit although there were few problems during Blazing Trails. Only one specific example of an employer problem was cited. One plumber in the unit was allowed to go on the exercise whenever and for as long as he wanted. However, he was then laid off from his job for several weeks after returning from Blazing Trails.

FAMILY ISSUES

Unit notification of Blazing Trails participation was kept secret until a month before deployment. The decision for secrecy was made by the Task Force. This created problems with employer notification and, therefore, employer support; but especially with families. In some individual cases, the news media found out before the families. The news media tried to build the exercise as "going to war."

COMPENSATION ISSUES

There were no noticeable compensation issues in this unit. Many of the soldiers interviewed regarded the pay as acceptable, despite losses associated with taking leave without pay from their regular jobs or using vacation leave. Since unemployment is high and there is a scarcity of jobs, these additional paychecks are welcome. It was noted with pleasure by several NCOs that the paycheck for Blazing Trails participation was on time. They received their paychecks as soon as they got back in country.

MISCELLANEOUS/SPECIFIC UNIT ISSUES

Unit Training

Officers, NCOs and Junior Enlisted all mentioned that they had no unit training at AT since 1984. The unit has been involved in split training in Bright Star and Blazing Trails exercises, and the last two ATs at FT Bragg and FT McCoy. This is, in part, due to the mission of this unit. This unit is conformed to support a theatre Army operation. There are very few exercises which require such support. Officers and NCOs report that morale problems arise when the unit does not train together. However, this opinion was not necessarily shared by the Junior Enlisted. The Junior Enlisted felt that fragmented training was not at all adverse.

Lack of appropriate equipment is a big problem for this unit. The NCOs report a mismatch between their available "1950's equipment" and their "training for 1980 equipment." Weekend drills were not useful to the Junior Enlisted because they have no equipment upon which to train. The lack of a nearby training area also infringes upon training. FT McCoy, the closest training area is 80 miles distant from this unit. Traveling to FT McCoy with the necessary equipment takes an entire day to accomplish.

Attrition

The normal term of first enlistment was six years until two years ago; the new enlistment term is now eight years. Because so many in the unit are students, attrition (non-completion of term of service) is artificially inflated. After college, many of the students must leave the area to find suitable employment. This means that many students will leave the unit four

years after joining--leaving the unit with a high attrition rate. In fact, movement out of the geographical area was cited as the most important factor in attrition by both Officers and NCOs. However, since some of these soldiers do transfer to other units in their new geographic area, they are not a loss to the total Reserves.

Promotions

Lack of promotions above the E-4 level were cited as a major retention issue in this unit. Because this unit is the only signal company in the geographical area, transfers to other units for a promotion is limited. Transfers to other units would require retraining into a new MOS, and the ARCOM does not like to pay for secondary MOS training. A related problem arises with Warrant Officers. The WO-2 with nine years in grade has attained the highest rank possible in this company. To get a promotion, he must leave the unit and go to a Battalion level unit. Officers fare no better in this unit. Several LTs have left this Reserve unit for National Guard units for promotions. Apparently, there was an excess of LTs in the Reserves, but several vacant positions in the National Guard.

DESCRIPTION (RESERVE ENGINEER BATTALION--TOLEDO, OHIO)

Unit

This engineering battalion has companies located in Toledo (HHC, Co. A, and Co C), Lima (Co D), and Bryan (Co B), Ohio. This unit was interviewed on 20 June 1987. This unit had attended Blazing Trails exercises from February to the end of May 1987.

Personnel

This unit is authorized to go to 114 percent strength. In June 1987, there were 756 in the battalion, with 24 full-time personnel. Based on a FORSCOM plan, the unit anticipated that the complement of full-time personnel would increase by eight slots.

The members of this unit were primarily employed by the glass and auto industries in the area. Approximately 10 to 15 percent of the soldiers were students in area colleges and vocational schools. Others were employed in seasonal jobs--landscaping, small construction, etc.

The Junior Enlisted indicated that their reasons for joining were primarily for monetary reasons: to earn or pay for schooling, to have a part-time job, or because they could earn more at drill than in their regular jobs. It was estimated that only about 25 percent of the Junior Enlisted had good jobs, and that many others couldn't live off the income from their civilian jobs alone. Still others were reported to have joined the unit just because the unit was going to Honduras. They had joined for the travel and adventure.

Many of the unit members travel up to 80 miles for weekend drills, attesting to either the monetary need or attractiveness for camaraderie or both.

EXERCISE

Preparation

According to the NCOs, there had been rumors ("scuttlebutt") about this unit going to Honduras two to three years before they actually did go. Official notification of their February to July 1987 deployment came in November 1986. This essentially gave the unit three months to prepare for deployment.

According to both NCOs and Junior Enlisted, the initial information was that everyone in the unit would be scheduled for at least one three-week increment in Blazing Trails. Subsequent information was that only personnel with specific required MOS and who were MOS qualified (MOS-Q) would be deployed. This was seen as a change from the original orders.

There was some additional train-up and time required of NCOs and Officers in preparation to going to Blazing Trails. This time was required for processing of equipment and personnel and for coordination. It appeared that the NCOs and Officers--especially the full-timers--worked additional hours--compensated and uncompensated--to prepare for Honduras. Even the Junior Enlisted, though, reported that they had "a lot of donated time" for preparations. The unit did conduct two additional MUTA-6s, one for personnel processing and updating vaccinations for Honduras, and another to compensate for a MUTA-4 the unit would miss while in Honduras. Video-tapes of Honduras and anti-terrorism lessons were within the normal weekend drill or within the in-processing MUTA-6 described above. No other skills training sessions were conducted for the entire unit from notification to deployment.

Execution

The unit's six month mission was to build 5 to 7 kilometers of roads in Honduras. They were required to take their own equipment for blasting rocks, leveling the ground, and building the road.

The unit conducted their equipment staging at FT McCoy. The bulk of personnel deployment from the Air National Guard Base in Toledo, Ohio, although some equipment operators left from FT McCoy with their equipment.

The men described 12-hour days everyday while in Honduras, with two shifts from 0600--1800, and from 1800--0600. There were no "weekends" off in Honduras. There were activities scheduled during off-duty time--movies, volleyball, and time to go to the PX at Big Bear. Because of the work schedule, the soldiers did not have any free time in the country. They suggested that if free time could not be made available to see the country

(and they did understand the security concerns), then a group tour of the country would have been appreciated.

Everyone thought the training was meaningful and well worth their time. When the Junior Enlisted compared their Blazing Trails experience with their last Annual Training at FT Grailing, there was no contest. They reported that they "played infantry" at FT Grailing, digging foxholes and sitting in them, covering them up and redigging them. Blazing Trails also compared favorably to REFORGER. In fact, they felt that the unit "should go down more often."

A medic in the unit stated that it was the "first time I used my MOS". For others, it was their first experience with live explosives. Use of live explosives within the Continental US would require an environmental impact statement, and are therefore not utilized.

NCOs thought that the soldiers in the unit got a "lot more training than what we could get here." They dynamited and blasted rocks, drove over mountainous terrain, developed and used carpentry and plumbing skills, and got practical experience in vertical construction. Maintenance training, however, was not viewed with ambivalence. The lack of materials hindered maintenance and led to cannibalizing from other equipment and scrounging from older dump sites--which was negatively viewed. The flip side of this is that they got to understand the "real side of how to do it in combat," and they did not have to worry as much about the red tape in getting materials.

Some soldiers felt that it would not be difficult to do this exercise every year, if they were told far enough ahead of time to notify and prepare their civilian employers for this. Others were more cautious and said that a three-week deployment to Honduras each year would not pose a personal hardship, but would be a problem with civilian employers.

Everyone we spoke with said that this was the best training they had had. They "enjoyed the challenge" and they were "doing something that's appreciated" and that they "worked on something (the road) that will last that long." They felt that what they had accomplished in Honduras was "quality and meaningful work."

At first, it was assumed that all unit personnel would go to Honduras on one or more increments, and plans were made accordingly. Unit personnel were assigned to the different rotations based on availability and personal requirements, orders were cut, and unit manifests were completed. The soldiers were sent to the airbase for transport to Honduras. When they arrived there, some of the soldiers who had received orders were told they had "stand-by" status, and would only be sent if the individual scheduled could not be deployed. If they were not required, they were denied passage and sent back to the unit. These individuals with "stand-by" status were not informed that they might not be deployed, until they arrived at the airport.

Although these non-deployed "stand-bys" were given two days of paid drill to partially compensate them for "good days" credit, these individuals were put in a difficult position. The civilian employers had already scheduled other personnel to replace the soldiers. Rescheduling of soldiers for another

two-week period caused hardship on both the soldiers, their replacements, and civilian employers. In addition, no alternate AT was initially planned for those who did not deploy because no such contingency was expected.

After this coordination problem with first increment, the unit implemented an alternative AT for "stand-bys." "Stand-bys" were allowed to complete their "annual training" at the unit (location) during the time they were scheduled for Honduras. This eliminated two problems: having to miss AT credit for retirement, and having to reschedule three weeks of AT with a civilian employer. However, these Junior Enlisted, NCOs and Officers were extremely disappointed that they were not allowed to go. Morale among these non-deployed stand-bys suffered as a result.

The NCOs complained that there was an overabundance of leaders (E-8 to O-6) in Honduras which led to chain of command problems. "Too many Chiefs and not enough Indians" often found Junior NCOs and Enlisted trying to satisfy conflicting orders. This led to many instances of frustration and confusion among the troops.

It appeared to the NCOs that the "system" (read Standard Operating Procedure) would change with each incremental rotation. Consequently, the information brought back by the previous increment was of limited usefulness for the following increments. It was reported that the Task Force Commander changed with each rotation which led to confusion. The Retainer force was thought to be "useless" for continuity. It was reported that their attitude was bad. They "didn't tell the new unit what was what, where the work was....just there's the equipment and go to it." Due to this situation, one NCO stated "it takes them (the Commanders and new units) three days to figure out where to start."

Recovery

In contrast with some of the other units that attended Blazing Trails, this unit reported a lot of contact between the Honduran civilians and the military. This gave them an appreciation for "how well off we are in this country", or as one NCO put it, to really know "what poor is."

The Junior Enlisted reported that if "ATs were always like that, we would stay in", and that the training was the "best in the Army". This underscores the NCOs' perception that participation in Blazing Trails will result in increased numbers of quality recruits and better retention of soldiers.

CIVILIAN EMPLOYER ISSUES

The economy in the Toledo, Ohio area is highly dependent on the auto industry, with many soldiers in this unit employed by Jeep and General Motors. The Enlisted said that one-half of the city was employed by Jeep. Other employers are in the glass industry, or Federal and State agencies.

Although the Junior Enlisted did not feel that employers presented a problem if given enough lead time, the NCOs lamented that they had employer problems every year. Considering that many Junior Enlisted were perceived to have marginal jobs or even to be unemployed, this is not a surprise. The NCOs presumably have more responsible positions in organizations, and would therefore have a harder time arranging for leave. In addition, when there are employer problems, it is the NCOs who must deal with employers to smooth ruffled feathers and to defend their Junior Enlisted.

Many of the NCOs in this unit used their vacation leave or leave without pay to go on this exercise. Very few Reservists were given military leave for this exercise. Some of the students in the unit took off a semester because there would have been no way to keep up with their studies and be part of the exercise.

FAMILY ISSUES

Although the members were excited about going to Honduras, their families were less than enthusiastic. Since some of the soldiers and their spouses had never flown before or been out of the country, this was viewed as an adventure by the soldiers but as something slightly fearful by the spouses. Some information on what to expect in Honduras was available to soldiers on video-cassette tapes, although not necessarily shared with spouses and families. Spouses and fiances were not sure where their soldiers would be in Honduras, how close to the fighting, or how safe they would be. They were concerned about the safety and well-being of these soldiers. The most useful weapon against this fear, it appeared, was the telephone. Soldiers report that they could telephone their families while in Honduras. That apparently helped alleviate some of the fears and concerns.

COMPENSATION ISSUES

Very few of the soldiers in this unit were granted military leave from their companies. Most took leave without pay (LWOP) or vacation leave to go to Honduras. The Junior Enlisted reported that they earned more in Honduras with the Guard pay than they would have on their normal civilian jobs. It was a different story for the NCOs. They report that their Guard pay was less than on their civilian jobs, although some stated that it probably didn't "make that much of a difference."

One interesting side-line to the employment and compensation situation in this area is the hiring practice at some automobile plants. These firms are likely to hire temporaries 19 weeks or 179 days contracts. Why? Personnel with 20 or more continuous weeks of employment are entitled to unemployment insurance (which is costly for the company); and personnel with less than 180 days of continuous employment are not entitled to union representation.

MISCELLANEOUS/SPECIFIC UNIT ISSUES

Promotions

The E-4's in the unit felt that there was no progression in the unit because of the number of prior service members who kept joining the unit. If the jump between E-4 and E-5 is "hard to jump," the promotion between E-5 and E-6 is seen as virtually impossible. Additionally, it was perceived that the paperwork for promotions is too slow and unpredictable because of the constant fluctuations in required promotion points.

Correspondence Classes

The soldiers report that getting school books for military correspondence courses is very difficult. What makes this an untenable situation is that the approved time to complete the courses is based on acceptance into the course, not when the soldier is in receipt of the books for the course. This can cause undue problems when books are late in reaching the soldier.

Weekend Drills

The Junior Enlisted report that there is "nothing to do on drills." They report listening to Tech Tapes, and reading books and manuals. Although they are paid approximately $100.00 per month per drill weekend (MUTA 4), some felt the lack of anything constructive to do on drills made it somehow "not worth it." Keeping in mind that some of these soldiers made more on one weekend drill than an entire week of work, makes one consider the magnitude of what they felt.

Recruiting

According to the NCOs, retention, not recruiting for the unit is the real problem. The unit is located in an area of high unemployment. Many come into the Reserves until they can find a good job and then they leave. Again according to the NCOs, 75 to 80 percent of the Junior Enlisted were unemployed when they came in (this probably includes students, although not specifically named). It was speculated that the unit's participation in Blazing Trails would help both recruiting and retention.

Community Perception of Blazing Trails

The younger soldiers perceived that age made a difference in the community attitudes toward their participation in Blazing Trails. They felt that the "older" people in Toledo were against their participation, something they called the "Vietnam syndrome." However, they felt that people their age (early 20's) thought that the exercise was "okay," that they were "excited" about it and envious of those going.

DESCRIPTION (RESERVE MILITARY POLICY UNIT--ORANGEBURG, NEW YORK)

Unit

This is a Reserve Military Police Company in Orangeburg, New York. Orangeburg is located 40 miles north of New York City, along the Palisades Parkway.

Three Officers, seven NCOs, and three Junior Enlisted were interviewed about REFORGER 86 and Blazing Trails 87 exercises. All those interviewed had participated in REFORGER 86, and were scheduled to attend Blazing Trails 87. At the time of the interview, the unit was attending the final drill before sending the unit's first increment to Blazing Trails 87. Consequently, although the intent of the interviews was to determine the effect of REFORGER 86 on attrition, many references and comparisons were made between REFORGER and Blazing Trails.

A brief outline of the last three years' annual training (AT) schedule indicates that this unit has had a heavy burden. They attended AT at

FT A. P. Hill in September 1985, normal two-week AT;
REFORGER January 1986, extended AT;
FT A. P. Hill in September 1987, normal two-week AT;
Blazing Trails in December 1987, extended AT.

The unit has also heard rumors that they will be attending REFORGER 89 for their next AT. This would mean three extended ATs within a five year (Fiscal Years) time frame. Whether it is true or not, the junior enlisted (who had gone through all of these exercises) thought the unit was constantly chosen because of its outstanding performance.

Personnel

According to the Officers in the unit, approximately 20 percent of the unit are college students, 20 percent New York City police, 10 percent Federal corrections/customs people, and 50 percent everything else--from unemployed to working for private industry and self employed.

This unit is authorized to be at 110 percent strength. Currently, there are 153 authorized positions and 157 assigned personnel. Of this total, approximately 120 consistently show up for drills. Prior to Blazing Trails preparations, 90 was the average show rate. Over 80 percent of the soldiers are military occupational specialty qualified (MOSQ).

There are five full-time positions in this unit: two Active Guard/Reserve (AGR), 1 Active Duty, and 2 Civil Service. One AGR position is unfilled, which places a burden on all other full-timers.

EXERCISE

Preparation

The Officers and NCOs were notified of their participation in REFORGER 86, in March 85; the Junior Enlisted were told in May or June 85. This appeared to be ample notification for civilian employers, families, etc. Sufficient time for logistic planning and preparation and skills training was allowed.

There were few additional drills for the Junior Enlisted in preparation for REFORGER. The exceptions were that November drill (MUTA* 4) was increased to a MUTA 5, and the January drill (when the unit would be in Germany) was accomplished in December, resulting in two drill weekends in December.

For NCOs and Officers, additional preparation time came in the form of "man days" and LADs (Love and Duty Days). They reported five extra mandays and innumerable LADS.

According to the NCOs and Officers, the biggest problem with REFORGER (and other similar extended exercises) is the difficulty in getting funds for equipment. This task was reportedly complicated by the two separate chains of command required for a task force mission within a peacetime environment. Deployment and travel orders and equipment requirements are dictated by the Task Force (be it REFORGER or Blazing Trails). However, the funding for purchases required by the Task Force mission must go through the Peacetime command--the ARCOM or CONUSA. In this case, the operational mission came from the REFORGER Task Force, but the funds for preparations and equipment, etc., came from First Army monies. This dual chain of command was not adequately coordinated to ensure efficient dispersal of funds and purchase of equipment. In many cases, this lack of coordination resulted in additional phone calls or trips to 1st Army HQ/Task Force HQ and supply depots. One frustrated NCO characterized this as "generating paperwork for the sake of keeping people employed."

Execution

REFORGER is a mobilization and training exercise held annually in West Germany. For this exercise, Active and Reserve and National Guard units in CONUS are brought over to Germany as they would be in a real mobilization. The Actives and Reservists work together. Company size or battalion size Reserve units replace or supplement similarly sized and same TO&E or TDA Active units, freeing more Actives to participate in combat.

These Reservists essentially freed a USAREUR military police company from garrison duty to participate in field exercises. The sister Active MP company was freed from the following typical garrison duties: road duty, accident investigations, garrison guard duty, garrison patrolling, etc., to work in the field exercises. The Reservists worked with the remaining two military police companies within the battalion.

Most of the Officers, NCOs, and Junior Enlisted felt that REFORGER 86 was an excellent exercise. Many of those interviewed took exception to calling REFORGER 86 a training exercise. Instead, they felt that this was a real "job." They were military police, doing what military police do. In that sense, REFORGER was not training to be military police, they were military police. To paraphrase an NCO, "it was a (military) law enforcement opportunity"--a chance to do what they had been training to do all year. These MPs were working beside Active MPs, on a one-on-one basis. From that perspective, this was not a unit training exercise, but rather an individual training, or at best platoon training exercise.

The personnel clerks or staff Junior Enlisted personnel were less positive about the value of REFORGER. It was reported that the personnel clerks had nothing to do. They had not taken over the 201 Enlisted Personnel files, so literally "twiddled their thumbs" for the entire time. They felt that the training at CONUS locations during normal AT was much better training for their MOS.

The Junior Enlisted, however, stated that REFORGER was excellent for giving them more confidence in themselves and their ability to do their job. This was seconded by the NCOs and Officers, who felt that the Junior Enlisted got the best training in comparison to the NCOs and Officers. The experience of working side by side with the Actives on a real mission and being, as one soldier described it--a shadow--was the best individual learning experience rather than unit training.

REFORGER was sometimes considered to be a "vacation." The Reservists worked hard the entire time they were there, but the fact that they were seeing something different, and doing something that they enjoyed (law enforcement) made it seem like an interlude from their normal work environment. To that extent, it gave the appearance of a "vacation."

The Junior Enlisted perceived that the Regular Army soldiers don't like or respect Reservists. They were considered to be "weekend warriors" and therefore not to be taken seriously. Many of the Junior Enlisted felt that the RA soldiers tried to intimidate them. They felt that they had to "watch your back and gear," that the RA couldn't be trusted. Further, the Reservists felt that they were "treated like garbage." It appeared, however, that closer working conditions led to better relationships. As one Reservist reported: "anyone you worked with was okay, but the others....." Due to the small number of female Reservists, these women were billeted in the same quarters with the female RA soldiers. Sharing this space meant that each RA soldier had less space than previously. The RA soldiers felt that they were moved for the Reservists, and that the Reservists were "invading their privacy" as well as their physical space. This led to some problems between the female RA and Reservist. This was not a problem for the male Reservists. The males stayed together as a group in the day room.

Working with the Actives made the Reservists more conscious of presenting a military appearance--with its attention to detail, and more motivated to do well, especially when the Actives were around. After REFORGER, this attitude was still evident.

Recovery

One of the perceptions that the NCOs and Junior Enlisted had is that of being with an "elite" Reserve unit. This perception is the product of being consecutively chosen for participation in REFORGER 86, Blazing Trails 88, and rumors of REFORGER 90 exercises.

One consequence of REFORGER is the feeling that they worked with the Regular Army and they "let them know we can do something" (sic). REFORGER gave the Junior Enlisted more confidence about their abilities to do their job well.

CIVILIAN EMPLOYER ISSUES

Many of the soldiers in this Military Police unit are, in fact, civilian police. In the New York City police department, there is a "regulation" that no police may join the Reserves (or National Guard) unless another police officer leaves a Reserve (or National Guard) unit. However, if they are already members of a Reserve unit, there was no perceived discrimination in hiring for the NYC police department. The reason for the limitation of the number of NYC police in Reserve units would be self-evident in the case of a Reserve deployment. If many civilian police were members of a unit and that unit were deployed, the NYCPD could conceivably find itself without enough law enforcement officers in New York City.

The NCOs felt that New York State is not very supportive of the Reserves. They said that a lot of "lip service" is paid, but very little real support. In particular, some companies and agencies gave the Reservists a difficult time with military leave, and these Reservists were forced to charge the time to vacation or annual leave.

Some large employers, however, did provide military leave. The NYCPD and the Federal agencies where many of these soldiers worked allowed 30 days of military leave per calendar year. Some of the larger private sector companies also allowed--and paid for--military leave. The calculation for military leave days is straight forward for private sector companies and the Federal agencies. Generally, 30 days of military leave per calendar year will cover all the drill days and AT.

For the NYCPD, however, it was slightly more complicated and less generous. Because the police force works 24-hours a day, seven days a week; and alternating shift schedules are the norm, the NYCPD calculates military leave days based on the "first day of conflict rule." This states that if a police officer is assigned to work in the NYCPD through Saturday but not on Sunday of a drill weekend, s/he will be charged with two days of military leave. Saturday is the first day of conflict. If, however, the officer is assigned to begin work in the NYCPD on a Sunday, s/he will only be charged with 1 day of military leave, as Sunday would be the first day of conflict.

FAMILY ISSUES

The Reservists we interviewed were, in many cases, very candid. When asked why they joined the Reserves, some NCOs replied that they used it "to get away from home" for one weekend a month. This is not to imply that there were family problems, but rather that some individual activity--separate from the family--was welcomed. In fact, the NCOs reported no family problems with extra drills or extended AT exercises--as long as there was advance knowledge of such.

One complaint heard from the NCOs and Junior Enlisted is that there are no commissary and PX facilities close enough for their families to patronize. This meant that their families were really not able to utilize many of the benefits the Army offers Reserve families.

MISCELLANEOUS/SPECIFIC UNIT ISSUES

Personnel Issues

The unit had a strength problem going into REFORGER, and required six "fillers" from other units within the Battalion. These fillers were fellow reservists in the same military occupational speciality. Although they did not drill with the unit, there appeared to be no problems with integrating them into the unit or with job performance.

Part of the personnel shortage for REFORGER was due to unprogrammed attrition, but many were allowed to elect individual education and development training (E&D) for AT credit in lieu of participation in REFORGER. Due to the timing (the last two weeks in January), many students were unable to attend REFORGER, and were therefore required to do E&D at the unit. In addition, a large number of people attrite before any AT--either at the pleasure of the unit or due to non-fulfillment of contract. This included personnel the unit attrited from their roster who did not regularly appear for weekend drill, and personnel who elected to leave the unit because they could not make the commitment to go to AT.

Attrition

Attrition in the unit is attributed to a soldier's unfulfilled expectation for training and/or discipline. It was reported that there was no place for the unit to train, and that monies for training supplies were inadequate.

The NCOs and Officers thought that they lost more people before going to AT at Ft. A. P. Hill than they did to REFORGER. This is because the soldiers felt that REFORGER was an expression of functioning in the "real world" and not merely a training exercise.

Unit Morale

Morale appeared to be very high in this unit. Many members of this unit travel over 60 miles (one way) to get to drills. The NCOs also report that the camaraderie is so good that some who were offered a promotion if they transferred to another unit, turned down the promotion rather than leave. There was, apparently, some talk about mandatory transfers with promotions. The NCOs felt that would result in many losses to the unit (and ultimately to the Reserves) because the soldiers did not want to leave the unit, but would be frustrated in their inability to achieve rank within the unit.

Next Exercise

There is a lot of ambivalence about the rotation to Honduras. Some Reservists felt that the preparation for Blazing Trails has improved unit and individual readiness, and that the Reservists want to go for two or more increments. They view Blazing Trails as a "real adventure," and a "real world experience." Others were not quite sure they wanted that much adventure. They reported that they would rather go back to Germany (REFORGER) than Honduras. Honduras was seen as less civilized than Germany, and the Junior Enlisted felt it would be easier to "relate" to the Germans than the Hondurans. The majority, however, were looking forward to the exercise. In fact, some students reportedly quit school for a semester so that they could participate.

Part of the ambivalence and fear may be something the unit inflicts upon itself. The strong and continued emphasis on preparing wills and powers of attorney, while necessary and to be desired, may unnecessarily frighten the younger Reservists. Reminding soldiers every drill for months on end to get their wills and powers of attorney in order may lead to exaggerated soldier and family fear. This might be balanced with realistic, positive information about the mission, the safety and security measures in existence, etc. Of course, this may be a "self-limiting" problem, in that once the first will or first power of attorney has been written, this will not be a problem. At that point, updating of wills and powers of attorney as a regular annual drill rather than something special for Blazing Trails or REFORGER would not be unduly frightening.

Training and Promotions

Many concerns and problems were expressed by the NCOs and Junior Enlisted about school (book) training and promotions. It appeared that a PLDC course was cancelled during the past year with no explanation to the soldiers. This was especially vexing as PLDC is required for promotion to E-5.

Books and materials for correspondence courses pose two problems. First, requests for books and materials do not result in delivery. Many of the Junior Enlisted and NCOs have received the books ordered. The second problem is one of timing. Time limitations are placed on completing a Military

correspondence course for credit. The time limit for completion is based on acceptance into the course. Acceptance into the course does not mean that the books are forthcoming. When the books are delayed or do not arrive, the soldiers find it difficult or impossible to complete the course on time.

E-5 promotion boards were reportedly not well advertised in this unit. The Junior Enlisted (E-4's) had no information when they would be held. This is especially frustrating since many of them felt that there were so few promotions above the E-4 level.

DESCRIPTION (ARMOR BATTALION--SOUTH CAROLINA NATIONAL GUARD)

Unit

This unit of the South Carolina National Guard(1-263) is a roundout unit to the 24 Infantry Division at Fort Stewart. The unit attended NTC in July-August of 1986--the eighth Guard roundout unit to attend NTC. It is an Armor unit which is currently training for transition to the M-1 tanks at Fort Stewart. The unit is located in towns in eastern South Carolina near the coast, and the main industries are tourism and farming. Unit personnel are about 240 miles from Fort Stewart--their main training area, and it takes about five hours of driving time. The unit is the only armor unit in the South Carolina National Guard.

The unit attended a normal training schedule in 1987 with an ARTEP Evaluation during annual training. In 1988 the unit was training up on new equipment (M-1's) at Fort Stewart which required three weeks of Annual training. They may participate in exercises in 1989 which involve deployment to Turkey.

Personnel

The unit is currently around 104 % of authorized strength, a drop from around 112 percent a year before attending NTC. They deployed 640 personnel to NTC using only around 20 fillers from other South Carolina units.

EXERCISE EXPERIENCE

Preparation

The unit was notified of NTC rotation in July of 1985, and started a year long train-up. Unit members stated that there were at least seven MUTA-6 (three-day weekends) during this year. These would require members to report on Thursday night and return late Sunday evening. In addition to the extra drills, Officers and NCO's put in much additional time during this year. This included recon missions to NTC, participation with OPFOR, and planning and preparation activities. One member stated that he had only seven weekends off during the year, and another worked every Friday in the three months prior to NTC. Generally, the train-up period was considered as stressful as NTC itself.

The unit felt it received excellent support from active personnel at Fort Stewart. Their active counterparts were available every drill weekend at Fort Stewart. It was duly noted that active personnel were giving up their weekends to help train the Guard units. Unit personnel felt they had received good support from the State of South Carolina in terms of resources, but felt state personnel had little to offer in the way of actual training preparation for NTC.

Unit personnel stated that a limited number of people were either discharged or switched MOS during the trainup due to poor performance. About 10 people were discharged due to poor performance. About 36 people encountered employer or school problems severe enough to limit their NTC participation. These individuals attended NTC for a shorter period than the rest of the unit.

Execution

This unit encountered severe equipment problems at NTC. Many of the tanks drawn from the pool failed shortly thereafter, and no more than one-half of the tanks were ever available during any battle. This was attributed to a changeover of contractors (Boeing lost the contract), and failure of the spare parts supply process--partly attributable to computer failure for six days. Unit personnel felt that the equipment was in poor condition at draw, and they used a good part of the four day draw to repair broken equipment. They also felt that they were used to repair the equipment at turn-in in lieu of Boeing personnel. About 70 people stayed a week after the end of the rotation to help repair equipment.

The unit transported wheeled equipment with them, but depended on NTC for tanks. They would like to take their own equipment in subsequent rotations.

Value of Experience

Nearly all personnel felt the training was the best they had experienced. Typical comments include:

- I learned more in three weeks than in 10 years.
- This is as close to war without being in war.

The most valuable lessons learned during NTC included:

- the value of cross-training and delegation to second line personnel
- the need to develop better subortinates to take over in absence of key personnel

- the need to improve communication and intelligence
- the ability to reconstitute and recover after battle
- improving support and resupply for forward companies-companies often outran the capacity to resupply.
- operation in different and expanded terrain and desert environment
- sleep plans did not work

Recovery

The unit did not appear to have any unusual problems in the period following NTC.

CIVILIAN EMPLOYER ISSUES

The Governor and AG sent letters to employers of reservists participating in NTC. Most employers supported the NTC rotation, and most reservists had no problems. For a minority of reservists, problems arose partly from the timing of NTC during the busy tourist season when employment peaked, and employee absence would be most felt. About 36 individuals did not deploy the full NTC rotation because of school and job conflicts.

Some employer problems were also present during the trainup caused by the MUTA-6's. Reservists stated it was hard to perform well on the civilian job after returning from training late on Sunday evening. Some felt discrimination in hiring or promotion from civilian employers because of reserve service. For those having problems, the following statement seems to summarize the dilemna faced by reservists, "Guard service should fit around your civilian life, but it seemed like my civilian life had to fit around my Guard service during the NTC period.

FAMILY ISSUES

Most families also supported the NTC experience with little direct evidence given about family issues. Family issues seemed not to be as prevalent as employer problems, although anedoctal data was given about marital breakups during the period. Many mentioned the loss of family vacation time because annual leave was taken to attend NTC or the additional MUTA-6's.

COMPENSATION ISSUES

Compensation issues were mentioned often during the interviews. Reservists stated that they thought most reservists lost money when attending NTC or annual training. Lost civilian income, driving costs and spending money during annual training often exceeds reserve pay during the period. Several self employed people stated that they had lost significant income due to the additional reserve time during train-up and at NTC. Many also took personnel vacation time to attend NTC.

OTHER ISSUES

Individuals felt that NTC rotations should be every three or four years. More frequent rotations would impact retention severely, and less frequent rotations would significantly impact readiness. Some felt that an extended period of train-up would be helpful. A 1 1/2 year period would perhaps reduce the intensity of week-end training and reduce associated problems.

Most felt that attendance at NTC would improve recruiting. The unit is unique in the state--being the only armor unit. This gives a special status to the unit, and many recruits seek the unit out to join. The unit also seems to draw individuals from more than the usual distance. One individuals had moved to Wash D. C., but still drives to Ft. Stewart and unit headquarters to attend drills and annual training.

III. MEASURING THE EFFECT OF INCREASED TRAINING ON ATTRITION

Policy options such as extended time policies have usually been regarded as contributing to unit training objectives through increased unit cohesion and enhanced mission capability. Extended time could also enhance individual occupational training if increased training opportunities allowed soldiers greater opportunity to qualify in their assigned MOS or greater opportunity to practice acquired MOS skills.

However, these potential gains from extended training, as we said earlier, must be weighed against the effect of extended training time on retention. Reservists enlist for parttime employment, and extended time could exacerbate conflicts with family, career, or personal obligations. If extended time caused retention levels to decline, then personnel turnover could leave units in a lower state of readiness.

It is useful, at this point, to place this discussion in a broader context, by examining recent evidence from the 1986 Survey of Reserve Components on reenlistment intentions and expressed willingness to provide extra training time. This provides broader evidence than can be gathered from an analysis of NTC, Reforger and Blazing Trails units alone, although, of course, the latter units have undergone the actual experience and offer much more direct and tangible evidence.

EVIDENCE FROM THE 1986 SURVEY OF RESERVE FORCES[1]

In the 1986 Reserve Component Survey, respondents were asked how likely they were to reenlist in the reserve under three different scenarios:

- the current training schedule;
- the current schedule plus two extra four-hour drills per month; and
- the current schedule plus an additional week of annual training.

Junior Personnel

Table 3.1 shows that extra drills or annual training would reduce the reenlistment rates of junior grade personnel by 7 to 13 percentage points. The retention effects vary systematically across component, prior service group, and policy alternative. The reservists are more adverse to two extra

[1]David W. Grissmer, Richard Buddin and Sheila Nataraj Kirby, *Improving Reserve Compensation: A Review of Compensation-Related Personnel and Training Readiness Issues*, R-XXXX-FMP, The RAND Corporation, (forthcoming).

Table 3.1

EFFECT OF EXTENDED TIME OPTIONS ON THE REENLISTMENT INTENTIONS OF JUNIOR PERSONNEL BY COMPONENT AND PRIOR SERVICE STATUS

(Proportion planning to reenlist)

	Current Policy	Two Extra Drills per Month	Extra Week of Annual Training
Army National Guard			
NPS	.498	.370 (12.8)	.396 (10.2)
PS	.558	.443 (11.5)	.462 (9.6)
Army Reserve			
NPS	.517	.395 (12.2)	.443 (7.4)
PS	.589	.482 (10.7)	.517 (7.2)

NOTE: Results based on 1986 Reserve Components Survey of Enlisted Personnel. The difference between the proportion reenlisting under current policy and under each option is reported in parenthesis.

drills per month than to an extra week of annual training. The retention reductions are larger in the ARNG than USAR for each grade and prior service group. The reenlistment rate of nonprior service is lower than for prior service personnel in each component, and nonprior service personnel are more adverse to each extended time option than prior service personnel.

Senior Personnel

Senior personnel are also less likely to reenlist under both extended time options. Table 3.2 shows that the patterns in reenlistment rate reduction closely mirror those for junior personnel, although the percentage point reductions are larger. The anticipated reenlistment rate of senior grade personnel is about 15 percentage points higher than that of junior grade personnel, so the large absolute retention reductions represent comparable proportional reductions. As for junior personnel, reductions are larger in ARNG than USAR, in the extra drill than in the extra annual training scenario, and in nonprior service than prior service personnel categories.

The Real Return to Reserve Participation

There are significant economic disincentives to providing extra training time which can be identified by examining the real return to reserve service. Such a measure needs to take into account not merely the benefits of reserve service in terms of the income and benefits (both monetary and nonmonetary)

Table 3.2

EFFECT OF EXTENDED TIME OPTIONS ON THE REENLISTMENT INTENTIONS OF SENIOR PERSONNEL BY COMPONENT AND PRIOR SERVICE STATUS

(proportion planning to reenlist)

	Current Policy	Two Extra Drills per Month	Extra Week of Annual Training
Army National Guard			
NPS	.658	.486 (17.2)	.494 (16.4)
PS	.691	.536 (15.5)	.558 (13.3)
Army Reserve			
NPS	.677	.522 (15.5)	.562 (11.5)
PS	.722	.585 (13.7)	.623 (9.9)

NOTE: Results based on 1986 Reserve Components Survey of Enlisted Personnel. The difference between the proportion reenlisting under current policy and under each option is reported in parenthesis.

but the very real costs some individuals face in terms of lost overtime oppotunities, lost civilian income, lower promotion opportunities and conflicts with family and employer. We present below estimates of net reserve income accruing to reservists.

Gross reserve income is the annual income received by the reservists for his participation in drills and annual training. It is specified by the reserve pay tables. Net reserve income subtracts from gross pay the following:

- federal, state, and FICA taxes;
- foregone civilian income resulting from attendance at annual training;
- transportation costs to reserve drills and annual training; and
- value of the time spent in traveling to drills and annual training.

Individual decisions to join or stay in the reserve will be made on the basis of net--not gross--income. This difference would be relatively unimportant if there were not substantial differences among reservists in the ratio of net to gross income. In fact, the higher percentage differences between net and gross income of junior personnel might explain the larger effects of differential training time on retention for these personnel.

Foregone civilian income can be calculated using civilian weekly wages and the civilian employer policy for annual training. Table 3.3 shows the employer pay policies for reservists during military leave. Approximately 28 percent of enlisted and 43 percent of officers receive full civilian wages while attending annual training and suffer no foregone income. Reservists who work for the public sector and large civilian employers account for most of those receiving full wages.

Table 3.3

CIVILIAN PAY STATUS FOR ANNUAL TRAINING

Question: Which of the following describes how you were paid for the time you took from your civilian job for Guard/Reserve obligations?

Grade	Full Civilian Pay + Military (%)	Partial Civilian Pay + Military (%)	Only Military Pay (%)	On Days I Didn't Work (%)	Total
Enlisted					
E3	10.9	8.3	68.9	11.9	10,730
E4	15.5	10.7	62.0	11.8	92,232
E5	26.6	15.7	48.7	9.0	108,991
E6	36.3	18.2	37.9	7.6	83,371
E7	44.2	20.0	28.5	7.3	37,006
E8	46.3	18.1	28.8	6.8	11,064
E9	55.6	16.6	22.7	5.1	3,208
Total	28.2	15.3	47.3	9.2	347,855
Officer					
01	23.9	8.4	53.8	13.9	4,202
02	34.9	11.1	42.8	11.2	6,800
03	40.8	13.7	36.5	9.0	16,497
04	46.1	13.4	29.3	11.2	17,699
05	52.3	12.6	26.6	8.5	7,927
06	64.1	8.6	18.7	8.6	2,856
Total	43.3	12.5	34.0	10.2	55,981

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 107.

All reservists not receiving full civilian wages will have some foregone income. Some employers have a policy of reimbursing the difference between civilian and reserve wages. This category accounts for 15 percent of enlisted and 13 percent of officers. Foregone civilian income in this case equals the reserve annual training pay. The remaining employed reservists receive no civilian income and foregone income equals their normal civilian income for the two week period during annual training. This category accounts for 47 percent of enlisted and 34 percent of officers. For unemployed reservists, foregone income is assumed to be zero.

Average foregone income for enlisted personnel is approximately $400 to $525 while attending annual training. Junior enlisted personnel lose almost as much as senior personnel in absolute terms. Since senior personnel have significantly higher civilian incomes, one might expect senior personnel to lose significantly more from annual training. However, this higher income is balanced by the much higher probability of senior personnel receiving partial or full wages from employers. An E-9 has a 56 percent chance of receiving full wages, while an E-2 has only an 8 percent chance. This higher propensity reflects both a self-selection of retained reservists who have better employer policies as well as a higher probability that older individuals will work for government or large employers, with more liberal policies.

The results for officers is more dominated by the income effect. It shows that forgone income rises with rank. O-1 and O-2 ranks lose amounts similar to enlisted personnel. However, higher ranking officers lose significantly more with O-6's losing about $1200 in civilian income. This is despite the fact that senior officers--like senior enlisted personnel--have a much higher probability of receiving full pay during annual training.

Transportation costs have two components: actual "out-of-pocket" expenses and the opportunity costs of driving time. "Out-of-pocket" costs are calculated using actual driving mileage and Internal Revenue Service driving costs of $.22 a mile. We assume reservists make two round trips for 11 drill weekends and one round trip for a combined annual training and drill weekend. The results show that annual transportation costs range between $100 and $200 for reservists with a tendency for officers and more senior enlisted personnel to have higher transportation costs. One explanation for the tendency of senior enlisted and officers to travel further to drills is again a self-selection process. Junior personnel who live further away may leave if high transportation costs cause net reserve wages to fall below their reservation wage.

The second component of transportation costs involves the value reservists place on their driving time. For most reservists driving time does not substitute for income earning activity, but rather for leisure time. We have assumed here that driving time is valued at one-quarter of civilian hourly wage. The results show that time costs are between $40 and $140 for enlisted personnel and $60 to $300 for officers. Time costs rise with rank because of higher civilian income for more senior personnel.

In total, the fixed costs of participation amount to $.45 cents of each after tax dollar for E-2 reservists, but only $.23 cents for E-9 reservists. For officers fixed costs are between $.25 to $.30 cents of each after-tax dollar.

Taxes were estimated on reserve income by using civilian income data from the 1986 Survey of Reserve Personnel and by assuming that marginal income from reserve service is taxed at the appropriate marginal tax rate for 1985. For Federal taxes the assumption was that marginal tax rates for reservists are similar to the average American with similar income. We have used Department of Treasury data providing actual marginal tax rates by income level. For state taxes, we have used state specific marginal income tax rates. For FICA taxes[2] we have used the appropriate tax rate and maximum income level for 1985.

The data show that younger enlisted personnel net less than one-half of their gross reserve income, and most of the loss comes from transportation and foregone income. The data also show that senior officers also net less than one-half of gross income, but here the primary reason is taxes. Generally, reservists "take home" between 45 to 60 percent of gross reserve income, with junior enlisted and senior officers taking home a smaller percentage.

It is evident that substantial differences exist between reserve gross and net income, and that these differences vary by officer/enlisted and by different grade levels.

We can compute a net hourly reserve income by dividing the net annual income increase from reserve participation by the net annual increase in working hours from participation. For fulltime workers, the increase in working hours is assumed to be all drill time (48 x 4 = 192 hours) plus 4 days of annual training (32 hours). The remaining annual training time (10 days) is assumed to substitute for civilian work time. For part-time and unemployed individuals, we assume additional net working hours as the difference between average civilian hours and fulltime hours in two weeks.

This hourly wage captures the monetary incentive from reserve service better than gross hourly wage, and should serve as a more definitive measure of retention decisions. It is interesting to compare this wage rate with the civilian after tax wage rate. We would expect that--other things equal--gaps between reserve and civilian wage rates would result in lower retention and less recruiting success. The data show that reserve officers earn a higher wage rate on their reserve job than their civilian job, while the reverse is true for reserve enlisted personnel, especially junior enlisted.

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[2]FICA taxes were not assessed against reserve compensation until January 1, 1988. We have included them here to make our compensation estimates apply to future income.

Nonmonetary Aspects of Reserve Service

We interpret nonmonetary benefits of reserve service very broadly to include all benefits except current and retirement income. This includes education benefits, commissary and exchange privileges, satisfaction of certain leisure needs through social interaction or getting away to a new environment, opportunity to use special equipment, and job satisfaction associated with reserve service. Some indication of the importance of these factors is provided by the responses to the 1986 Reserve Survey. Individuals rated factors that were important in their decision to stay in the reserve. Several interesting results emerge:

- Three reasons rank far above other reasons for staying and are mentioned by over 50 percent of reservists as major contributors to staying: retirement benefits, pride in accomplishment, and service to country.

  -- Retirement benefits are most often mentioned for both enlisted and officer as a major contributor to staying in the reserve. These results are of course stronger for the more senior enlisted personnel and officers.

  -- Pride in accomplishment and service to the country are mentioned almost as often as retirement benefits as a major contributor with higher ranking personnel mentioning these more frequently.

- Three reasons are cited over one-third of the time as major contributors by enlisted personnel: serving with people in the unit, "just enjoy the Reserve," and current income needs. The first two are mentioned more frequently by more senior people, while junior people tend to mention current income.

- Promotion, challenge of military training, and "getting away" were mentioned by between one-fourth to one-third of reservists.

- Approximately one-fifth of enlisted personnel mention educational benefits, training for civilian jobs, and opportunity to use military equipment as major contributors with more frequent mention by junior personnel. All of these are less important to officers.

The motivation for staying in the reserve is neither purely economic or noneconomic. It is clear that reserve service satisfies a variety of current and deferred income needs, patriotic, social and leisure needs and growth needs through education and training requirements.

Monetary and Nonmonetary Opportunity Costs of Reserve Service

Moonlighting labor market decisions are complex partly because they often require a commitment of time to work--time that has several other demands on it. These are the opportunity costs of reserve service, and there are both monetary and nonmonetary aspects of these costs. For a typical reservist with a family and a full-time job, hours spent on the reserve job mean fewer leisure hours, less time available to spend with the family, on the regular job, another moonlighting job, or in school. This requires a careful balancing of the benefits of a moonlighting job against the value placed on additional time spent in other pursuits.

The *monetary* opportunity costs arise because the reserve job may involve foregoing the opportunity to work overtime hours on the regular civilian job, to work at another moonlighting job. Occasionally, the reservist may be passed over for promotion. These opportunity costs can be quite different for individual reservists. For some, lost income for overtime may predominate, while for others, conflicts with spouse over reserve time may dominate. We estimate below the prevalence of these opportunity costs from the 1986 Survey of Reservists.

Survey data indicate that a significant number of reservists lose overtime opportunity and wages as a result of the reserve job (Table 3.4). These data indicate that 47 percent of enlisted, but only 24 percent of officers frequently or occasionally lose overtime opportunity/extra pay due to reserve service. Lost overtime is much more prevalent among lower ranking enlisted and officers. Less senior personnel are also more likely to be paid wage premiums for overtime (Table 3.5), so income losses from overtime may be a significant factor for younger personnel.

Whether reserve service hinders promotion or advancement in civilian jobs is more difficult to identify. Survey data do indicate that some reservists feel that their participation has hindered advancement, however a larger percentage feel reserve service has helped (Table 3.6). Another indicator of possible lost opportunity in civilian jobs is the conflict often felt in working two jobs. Survey data asked reservists about supervisors' attitudes toward reserve service (Table 3.7). Approximately 15 percent of officers and enlisted have supervisors with somewhat or very unfavorable attitudes. These attitudes could translate into lower promotion opportunity or possibly even dismissal. However, the data also indicate that over 50 percent of supervisors have a positive attitude toward reserve service. This could result in improved promotion opportunity.

There appears to be little difference in civilian supervisor attitude between junior and senior enlisted personnel, but junior officers encounter more employer problems. One might expect that--other things equal--senior personnel would encounter fewer employer problems due to self-selection. However, more senior reserve personnel have longer working hours on their civilian jobs and more frequently work over 40-hour weeks. Officers also work significantly longer work weeks than enlisted personnel. Thus senior personnel probably encounter more employer problems due to simple working hour conflicts than do junior personnel.

Table 3.4

LOST OVERTIME OPPORTUNITY FOR RESERVISTS

Question: In 1985, did you lose opportunities for overtime/ extra pay because of your Guard/Reserve obligations?

Grade	Yes, Frequency (%)	Yes, Occasionally (%)	No (%)	Total
Enlisted				
E3	23.4	33.8	42.8	11,660
E4	16.9	32.6	50.5	98,427
E5	14.4	33.4	52.2	115,444
E6	13.9	32.3	53.8	89,209
E7	12.5	28.9	58.6	39,511
E8	10.2	26.8	63.0	11,978
E9	8.8	21.4	69.8	3,434
Total	14.9	32.1	53.0	371,001
Officer				
01	11.1	29.4	59.5	4,595
02	8.2	27.3	64.5	7,327
03	7.9	16.5	75.6	18,366
04	6.9	14.0	79.1	20,787
05	6.1	10.0	83.9	9,694
06	6.9	9.1	84.0	3,796
Total	7.5	16.4	76.1	64,564

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 103.

Table 3.5

OVERTIME PAY RATE FOR RESERVISTS

Question: In 1985, how were you paid when you worked over 40 hours a week?

Grade	Not Paid Extra (%)	Paid at Regular Pay Rate (%)	Paid One-half Time (%)	Paid Double (%)	Paid More Than Double (%)	Total
Enlisted						
E3	17.9	17.2	62.7	1.5	0.7	11,239
E4	19.4	16.5	61.1	2.5	0.5	95,347
E5	23.7	12.6	62.0	1.5	0.2	111,999
E6	31.5	10.2	56.4	1.6	0.3	86,616
E7	39.0	8.7	51.0	1.3	0.04	38,384
E8	46.9	9.3	42.6	1.0	0.2	11,686
E9	58.8	6.6	33.1	1.5	0.0	3,396
Total	27.0	12.6	58.3	1.8	0.3	359,940
Officer						
01	45.7	11.2	41.9	0.9	0.3	4,380
02	50.1	14.2	24.1	1.2	0.4	7,123
03	68.1	13.2	18.0	0.6	0.1	18,001
04	77.7	12.2	9.4	0.3	0.4	20,473
05	79.9	14.2	5.3	0.2	0.4	9,631
06	82.3	16.0	1.7	0.0	0.0	3,728
Total	70.2	13.2	15.8	0.5	0.3	63,337

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 102.

Table 3.6

EFFECTS ON CIVILIAN PROMOTION OF RESERVE SERVICE

Question: Some people feel that participation in the Guard or Reserve helps them get ahead in their civilian job. Others feel that their membership in the Guard or Reserve has hurt their chances for getting ahead in their civilian work. What effect has being a member of the Army National Guard/Army Reserve had on your getting ahead in your current civilian job?

	E1-E4	E5-E9
Helped me a lot	16.6	13.6
Helped me somewhat	18.7	11.6
Had no effect	51.7	63.6
Hurt my chances somewhat	8.9	8.7
Hurt my chance a lot	4.1	2.6

SOURCE: Tabulations of 1979 Reserve Force Personnel Survey for those working.

Table 3.7

SUPERVISORS' ATTITUDE TOWARD RESERVE SERVICE

Question: What is your immediate (main) civilian supervisor's overall attitude toward your participation in the Guard/Reserve?

Grade	Very/Somewhat Favorable (%)	Neither (%)	Somewhat/Very Unfavorable (%)	Total
Enlisted				
E3	57.3	26.4	16.3	10,332
E4	57.8	27.3	14.9	87,446
E5	57.2	27.3	15.5	104,050
E6	57.8	27.3	14.9	81,052
E7	59.1	26.1	14.8	36,207
E8	62.1	24.1	13.8	10,846
E9	65.1	20.4	14.5	3,191
Total	57.9	27.0	15.1	334,358
Officer				
01	55.0	25.6	19.4	3,864
02	57.3	24.0	18.7	6,610
03	55.9	28.8	15.3	16,150
04	60.3	25.6	14.1	17,412
05	58.8	29.8	11.4	7,740
06	71.0	18.5	10.5	2,788
Total	58.6	26.6	14.8	54,563

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 94.

Additional detail on sources of employer conflicts is given in Table 3.8. The data show that weekend drills cause the fewest employer conflicts when compared to absence from annual training, extra time at reserve work or actual time spent at work on reserve matters. Annual training absence seems to cause problems more frequently than extra time or time spent at work.

The picture that emerges is that more senior individuals have more responsibility and time demands both from their civilian and military jobs. Some employer conflicts occur for approximately 15 to 25 percent of reservists at all experience levels, and officers seem to encounter somewhat more problems than enlisted.

Another opportunity cost from reserve service is loss of vacation time. Employers are legally bound to provide military leave for reserve annual training; however, as Table 3.9 shows, not all reservists receive military leave. Approximately 10 percent of officers and enlisted used vacation days to meet Reserve obligations. This loss of vacation time may be one source of family conflict over reserve service.

The conflict between family and reserve time is shown in Table 3.10. This data shows that over one-third of officers encounter some problems with time for annual training and extra time spent at reserve duty, while about one-fourth encounter family problems with weekend drills. Mid-level officers at the O-3 and O-4 level encounter more problems than either younger or older officers. This is particularly troublesome because these groups presumably have had a longer period of time to adjust to the demands of reserve participation. This could be related to presence of younger children.

For enlisted personnel about one-fourth encounter family problems with annual training and extra time, while only 15 percent encounter problems with drill time. Younger enlisted personnel have more problems with annual training absence than older personnel. While a large proportion of spouses have generally favorable attitudes toward Reserve participation, between 10-24 percent of enlisted personnel and 8-15 percent of officer personnel face an unfavorable spouse attitude. Younger officers and enlisted face a higher incidence of unfavorable attitudes. Almost 25 percent of E-3 spouses have unfavorable attitudes.

MEASURING THE EFFECTS OF INCREASED TRAINING ON NTC, REFORGER AND BLAZING TRAILS UNITS

We have outlined above some of the evidence from the 1986 Reserve Survey that suggests that reservists face some very real costs attendant on reserve participation. Primarily among them is the low net return to reserve service due to taxes, foregone civilian income, transportation costs, lost overtime opportunities and conflicts with both family and employer. As the case studies made clear, these are exacerbated for those individuals in units actually undergoing more intense training. This is particularly true of the NTC units that are required to schedule extra drills the year before the actual NTC date as well as to increase annual training time at NTC itself.

Table 3.8

EMPLOYER RELATED PROBLEMS DUE TO RESERVE SERVICE

Question: How much of a problem for your main employer (or for you, if self-employed) is absence for the following?) (Percent are for those reporting a "serious/somewhat of a problem")

Grade	Weekend Drills	Annual Training	Extra Time Spent at Guard/Reserve	Time Spent at Work on Guard/ Reserve Business
Enlisted				
E3	19.0	34.6	31.5	23.3
E4	15.6	31.3	27.2	19.5
E5	14.0	27.8	28.3	21.0
E6	12.7	27.6	25.9	21.0
E7	12.4	27.6	24.3	21.7
E8	11.9	27.2	22.1	19.9
E9	10.4	28.0	23.3	20.6
Total	14.0	28.8	26.8	20.7
Officer				
01	15.1	35.6	31.8	25.8
02	13.1	30.8	33.5	24.5
03	14.6	39.5	33.2	26.8
04	13.3	37.6	32.1	26.5
05	10.1	35.7	27.0	22.4
06	12.8	33.2	25.5	22.1
Total	13.3	36.7	31.4	25.3

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 95A-D.

Table 3.9

STATUS OF MILITARY LEAVE FOR ANNUAL RESERVE TRAINING

Question: Which of the following describes how you got time off from your civilian job to meet your Guard/Reserve obligations in 1985?

Grade	Self-Employed (%)	Military Leave/Leave of Absence (%)	Used Vacation Days (%)	On Days I Didn't Work (%)	Total
Enlisted					
E3	7.0	57.6	12.0	23.4	11,474
E4	6.0	61.6	10.0	22.4	96,817
E5	5.6	67.2	10.4	16.8	114,152
E6	6.2	70.7	11.1	12.0	88,882
E7	6.1	74.2	11.0	8.7	39,501
E8	7.3	72.6	13.0	7.1	11,976
E9	6.2	75.9	13.2	4.7	3,404
Total	6.0	67.2	10.7	16.1	367,543
Officer					
01	8.6	63.1	7.5	20.8	4,540
02	7.4	70.7	6.9	15.0	7,333
03	10.2	69.2	11.1	9.5	18,372
04	15.0	63.6	10.6	10.8	20,859
05	17.9	60.5	13.0	8.6	9,708
06	24.4	56.2	12.2	7.2	3,794
Total	13.3	65.1	10.5	11.1	64,606

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 106.

Table 3.10

FAMILY PROBLEMS DUE TO RESERVE SERVICE

Question: How much of a problem for the family is absence for the following?) (percent are for those reporting "serious/somewhat of a problem")

Grade	Weekend Drills	Annual Training	Extra Time Spent at Guard/Reserve
Enlisted			
E3	18.7	38.3	30.1
E4	16.3	30.2	22.1
E5	13.8	24.1	21.1
E6	14.9	24.0	22.7
E7	14.5	22.9	22.2
E8	19.1	24.7	30.6
E9	20.8	23.2	33.9
Total	15.1	25.2	22.6
Officer			
01	13.6	25.0	29.5
02	19.6	29.4	36.4
03	27.9	37.6	42.9
04	30.0	36.6	40.8
05	27.2	32.5	34.8
06	23.7	26.5	27.9
Total	26.7	34.3	38.5

SOURCE: 1986 Reserve Components Survey of Enlisted Personnel and Officers, Question 87A-C.

There are three major causes of attrition in the NTC units. The first is family and employer problems, of the same type that were delineated above. The second source is, also as we showed above, lost income and vacation time during additional drills and annual training time. Many reservists who attend drill or AT in place of civilian work lost money for every hour put in on the Guard job. More hours put in means more lost income. The third reason is the tighter quality and performance standards that units promulgate in preparation for NTC. Most units appear to have either transferred, separated or retired some members because of some combination of lack of physical fitness, marginal performance or lack of dedication to the NTC mission. These losses usually occurred early in the training schedule and decisions seem to be motivated primarily by a desire to perform well at NTC.

While case studies can provide explanations for losses and drops in strength, it is necessary to develop statistical models in order to develop more precise estimates of the magnitude of losses which can reasonably be attributed to NTC or participation in other training exercises. Such analyses can also identify types of reservists suffering larger or smaller than average losses.

While the main focus of policymakers has been the change of strength of units attending NTC, we believe that a better policy measure is the attrition probability of members from units attending NTC/Reforger/Blazing Trails as compared to comparable units not selected for these exercises. Attrition is a more immediate and directly related measure of the effects of the NTC process than is the strength level of the unit. Unit strength, unlike attrition, is a more weak indicator of the effects of increased training time because it depends on both attrition and accession levels. If units recruit heavily during this time period to compensate for large losses, then unit strength may remain steady and provide an erroneous picture. In such a situation the unit would likely be replacing experienced unit members with more inexperienced members, and although strength might be steady, the quality and training readiness of individuals in the unit would decrease.

This report, like the earlier paper, can address directly only issues of attrition. However, it is important to stress that inreased training time requirements (or expectation thereof) may affect recruiting success both in the short- and long-run. In the short-run, units might reduce recruiting efforts during the trainup period, and recruiting might fall. Recruiting efforts might also increase as units try to achieve higher manning levels. In the longer run, recruiting success might rise or fall depending on whether recruits view attending these exercises as an added incentive or a deterrent. Thus, both gains and losses need to be monitored in order to get a more comprehensive picture of the effects of increased training time on units.

This chapter presents the results of statistical models that attempt to estimate the effects of various demographic and service related variables on attrition, particularly those related to attending the NTC/Reforger/Blazing Trails exercises. The models allow us to compare attrition probabilities for members of units attending these exercises and those in comparable units not attending these exercises. These comparisons are done for reservists with

different characteristics, so we can also determine what types of reservists in units have higher or lower loss probabilities.

DATA BASE

As mentioned above, the basic methodology here consists of comparing the attrition experience of the units attending the exercises with similar units that are not. However, no units serve as perfect comparisons because all units have somewhat different kinds of personnel, are located in different areas, have different missions, functions and authorized strength and different training intensities. In choosing control units we thought it important to limit ourselves to units in the same state, to those having the same approximate size and whenever possible the same function (infantry, armor, etc.). This was not possible in every case. In Georgia in particular, since three units had attended NTC, it removed the natural comparison units for each of the NTC units. In some states we found more than one unit that met the criteria and included all of these units.

In order to develop comparison samples, we obtained a list of all National Guard and Army Reserve units within each state, identified by function, type of unit, location, and authorized and actual strength. Wherever possible the control units included units of similar function and authorized strength level as the unit selected for the training exercise. Units of similar type were chosen as a possible sample and were then examined to see if they were in existence at least one year prior to the date that the unit attended the NTC/Reforger/Blazing Trails exercises. Table 3.11 lists the NTC and the comparison units chosen. Tables 3.12 and 3.13 present the sample for the Reforger and Blazing Trails units respectively.

Table 3.11

NTC AND COMPARISON UNITS BY STATE

	NTC Units			Comparison Units	
State	UIC	Unit	Date	UIC	Unit
Alabama	WP0L	2-152 AR BN	June 1985	WP0J	1-131 AR BN
Georgia	WPDA	1-121 INF BN	September 1984	WQV3	1-230 FA BN
	WPDB	2-121 INF BN	March 1985	WPDG	1-214 FA BN
Louisiana	WPQR	3-156 INF BN	August 1985	WVCA	0-156 AR BN
	WPQQ	2-156 INF BN	June 1986	WPQJ	0-141 FA BN
Minnesota	WPUZ	2-136 INF BN	April 1984	WPUV	2-135 INF BN
North Carolina	WPJN	2-120 INF BN	June 1985	WQYW	1-119 INF BN

Table 3.12

REFORGER AND COMPARISON UNITS BY STATE

State/ Component	Reforger Units UIC	Unit	Date	Comparison Units UIC	Unit
Army Reserve					
Alabama	WQ6Q	851 QM CO	January 1986	WRVH	304 CHEM CO
	WRJE	310 CHEM CO	January 1986	WS1C	0-287 TC CO
	WRJG	326 CHEM CO	January 1986		
Pennsylvania	WSCA	339 MED HOSP	February 1986	WSCE	348 MED HOSP
Army National Guard					
Iowa	WP1N	224 EN BN	September 1984	WPU7	(?)
				WPU8	
Massachusetts	WTVU	2-181 INF BN	January 1985	WPF5	1-182 INF BN
South Carolina	WVGW	111 SIG BN	January 1985	WVBT	(?)
Wisconsin	WPLC	2-127 INF BN	January 1986	WPLA	1-126 FA BN
	WPLK	1-632 AR BN	January 1986	WPK8	121 FA BN

Table 3.13

BLAZING TRAILS AND COMPARISON UNITS BY STATE

State/ Component	Blazing Trails Units UIC	Unit	Date	Comparison Units UIC	Unit
Army Reserve					
Alabama	WRYB	926 EN BN	March 1986	WQ20	383 CS CO
	WQ6S	786 MAINT BN	March 1986	WRGD	15 FA BN
	WQ6L	803 CS CO	March 1986		
Georgia	WQ7S	1014 S&S CO	March 1986	WQ7Z	377 QM CO
Kentucky	WRJ9	478 EN BN	June 1986	WSS2	400 CS CO
				WQ1A	672 CS CO
Tennessee	WRKH	844 EN BN	February 1986	WSJ7	401 MP HHC
	WTD1	467 EN BN	February 1986	W8M1	3397 USA GARRISON
Army National Guard[a]					
Missouri	WXAL	203 EN BN	January 1986	WXAK	1140 EN BN
	WP04	110 EN BN	April 1986	WTT7	1138 EN BN

[a]The original sample included a South Carolina unit (WP08: 122 EN BN), that attended in May 1985. Because of data problems, this unit was dropped from the final sample.

For each of these units, quarterly personnel records were generated using the Reserve Components Common Personnel Date System (RCCPDS) maintained by the Defense Manpower Data Center (DMDC), from FY1983 till the end of FY1986. In order to maintain comparability across units (since units had differing exercise dates), we selected all personnel records starting from one year prior to the exercise date and up to six months subsequent to that date[3]. This gives us an eighteen month time period for all units except for Louisiana (second NTC unit), and Kentucky (Army Reserve Blazing Trails unit). These units attended the exercise during June of 1986 and thus have a slightly shorter post-exercise period. For all units that had a longer post-exercise history i.e. those who attended the exercise prior to 1986, a separate file was built containing the full history of these unit personnel till the end of FY1986. This file allowed us to make comparisons between shorter- and longer-term patterns of attrition. Table 3.14 shows the total length of time for which we have data available for units meeting this criterion and for whom we were able to examine longer-run attrition. We have between six months to two years of additional history for these units. Because all the Blazing Trails units attended in 1986, we do not have comparable longer-run data on any of these units.

COMPARING PATTERNS OF ATTRITION IN NTC/REFORGER/BLAZING TRAILS AND SELECTED COMPARISON UNITS: ALL STATES COMBINED

We present below evidence on the patterns of overall attrition and transfers among units selected for the training exercise and control units on an aggregated level. The next section presents state-specific results. We first develop a multivariate attrition model to assess the importance of variables that could be hypothesized, both from the case studies and previous research, to affect attrition. In particular, we wanted to gauge the effect of the increased and intensive training at the National Training Center (NTC) and to compare this to the experience of units attending the Reforger and Blazing Trails exercises. We were also interested in seeing whether there was any difference in the attrition experience of units from the two Army components who had attended the same exercise. From the standpoint of the Army National Guard and Army Reserve, these models can be used to examine and predict the distribution of losses in units

[3]The data obtained from DMDC were quarterly data. As such, it was not possible to extract an exact eighteen month history of each unit. The quarter corresponding to the date of the exercise was chosen as the start date in each instance for both the selected unit and its comparison unit, and two quarters beyond the date of the exercise was used as the cutoff for the eighteen month time period. On average, this gives us an eighteen month history.

Table 3.14

UNITS CHOSEN FOR THE LONGER-RUN ATTRITION ANALYSIS

Exercise/State		Unit	Total Time Period Months[a]	Additional Time (Months)[b]
National Training Center				
Alabama	WPOL	2-152 AR BN	27	9
Georgia	WPDA	1-121 INF BN	36	18
	WPDB	2-121 INF BN	33	15
Louisiana	WPQR	3-156 INF BN	27	9
Minnesota	WPUZ	2-136 INF BN	42	24
North Carolina	WPJN	2-120 INF BN	24	6
Reforger				
Iowa	WP1N	224 EN BN	36	18
Massachusetts	WTVU	2-181 INF BN	33	15
South Carolina	WVGW	111 SIG BN	33	15

[a]Personnel data obtained were quarterly data. As a result, the months shown here are not exact counts from the date of the exercise. The closest quarterly date was used to build these files.

[b]Total Time Period - 18 months.

DEMOGRAPHIC PROFILE OF NTC/REFORGER/BLAZING TRAILS UNITS AND COMPARISON UNITS

Table 3.15 present profiles of NTC, Reforger and Blazing Trails and comparison units by selected demographic characteristics. The units are similar in many respects but different in others. There are enough differences that one must be cautious in interpreting simple differences in overall attrition rates as opposed to results from multivariate models which control for personal characteristics. In terms of the NTC units, the comparison units have a much higher proportion of blacks. Other than that, there are some small differences in the proportions of officers, Category IV recruits and a slightly different distribution of experience.

The same differences are evident in the demographic profile of the Reforger and comparison units: the latter have a much higher proportion of blacks, those in Category IV and slightly older, more experienced personnel. In the Blazing Trails sample, the comparison units have a somewhat *smaller* proportion of blacks and Category IV recruits, and a surpisingly large proportion of officers. The Blazing Trails units have a somewhat higher proportion of younger personnel (those with less than 3 years of service).

Table 3.15

A PROFILE OF NTC/REFORGER/BLAZING TRAILS AND COMPARISON UNITS BY SELECTED CHARACTERISTICS

Characteristic	NTC Sample	
	NTC Units	Comparison Units
Percent black	29.8	42.4
Percent officer	6.4	3.7
Percent age ≥ 40	13.9	15.8
Percent single	43.2	42.0
Percent nonhigh school graduate	25.3	22.8
Percent Category I, II[a]	34.1	31.8
Percent Category III	60.7	59.4
Percent Category IV	5.2	8.8
Percent 0 ≤ YOS[b] < 3	14.9	11.2
Percent 3 ≤ YOS < 6	30.3	27.1
Percent 6 ≤ YOS < 11	26.5	27.3
Percent 11 ≤ YOS < 20	22.5	27.8
Percent 20 ≤ YOS	5.9	6.6
(N)	5,409	6,461

[a]Recruits are classified into Category I-IV mental groups based on scores received on the entrance examination (Armed Forces Qualifying Test, or AFQT). Category I receive scores of 80 and above; Category IV receive scores of 30 and below.

[b]YOS = years of service.

We turn now to examine patterns of attrition in our sample for the three types of units. We first look at aggregated attrition and transfer rates, and then at rates of attrition among different groups of reservists classified by demographic and other characteristics. These overall rates are useful in that they summarize in an understandable way the actual experience of the units and groups of individuals within them. However, as we mentioned above, one must interpret simple differences between the units attending the NTC/Reforger/Blazing Trails exercises and their comparison units with caution because as shown above they are not identical in their demographic and experience characteristics.

PATTERNS OF ATTRITION IN NTC/REFORGER/BLAZING TRAILS AND COMPARISON UNITS

It is important to note that the definition of attrition will differ depending on the viewpoint and context. From the viewpoint of the unit, all losses need to be included--any separation represents a loss both in overall strength and readiness of the individual unit. From the component's point of view, transfers to other units within the component do not represent a loss to the component; only losses to other components or to civilian life would be included.

Table 3.16 examines attrition in units attending the NTC/Reforger/Blazing Trails exercises versus comparison units using these two different definitions. NTC units appear to have an overall unit attrition rate of approximately 30 percent over an eighteen month period; comparison units have a markedly lower attrition rate of 22.6 percent over the same time period. The proportion of transfers is also higher in NTC units. The rate of transfers to other Guard units is 4.5 percent for NTC units compared to 3.0 percent for non-NTC units. However, the difference in unit attrition is mainly due to increased Guard separations as opposed to transfers from the NTC units. Attrition due to separation was almost 23 percent higher in NTC units than the rate for the comparison group, while attrition due to both separation and transfers was 25 percent higher for NTC units.

For the Reforger and Blazing Trails samples, the differences are much smaller between the units attending these exercises and their comparison units. For example, overall unit attrition is 6 percent higher in the Reforger units and only about 3 percent higher in the Blazing Trails units than the respective comparison units. Again, these differences are due primarily to separations, not transfers. Indeed, the comparison units for the Blazing Trails sample have a slightly higher transfer rate than the Blazing Trails units.

The longer-run separation rates represent the average for units with varying lengths of history. However, it is interesting to note that the differences between the NTC and the comparison units continue into the longer time period and the magnitude of these differences is identical to those experienced in the shorter time period. Well over 40 percent of the NTC unit personnel have separated by the end of FY86, on average, about two years after the NTC rotation, as compared to less than a third of the comparison unit personnel. On the other hand, the small difference in overall attrition that we had seen earlier with regard to the Reforger units is almost entirely eliminated over the longer-run time period, although the proportion separating from the component, as opposed to transferring to another unit within the component, is still about 9 percent higher than the comparison unit.

Table 3.17 presents aggregated attrition rates for our three samples for selected groups of reservists. Once again, this offers a simple way of summarizing the the relative experiences of the groups, although these, of course, represent gross effects of each characteristic, not the net effect. In other words, the attrition rates represent the effect not just of the

Table 3.16

ATTRITION/TRANSFERS IN NTC/REFORGER/BLAZING TRAILS VERSUS COMPARISON UNITS OVER THE SELECTED EIGHTEEN MONTH AND LONGER-RUN TIME PERIODS

Type of Units	Separated from the Guard Unit (%)	Transferred to Another Guard Unit (%)	Overall Unit Attrition (%)	Still Remaining in Original Unit (%)	(N)
Selected Eighteen Month Period					
NTC units	25.46	4.49	29.95	70.05	(5,409)
Comparison units	19.56	3.01	22.57	77.43	(6,461)
Reforger units	23.34	5.08	28.42	71.58	(3,659)
Comparison units	21.14	5.58	26.72	73.28	(2,668)
Blazing Trails units	27.38	4.15	31.53	68.47	(3,927)
Comparison units	25.17	5.45	30.62	69.38	(4,347)
Long-Run					
NTC units	32.59	10.21	42.80	57.20	(5,409)
Comparison units	25.37	6.67	32.04	67.96	(6,461)
Reforger units	28.70	8.20	36.90	63.10	(3.657)
Comparison units	26.01	10.23	36.24	63.76	(2.668)

Table 3.17

ATTRITION RATES FOR SELECTED GROUPS OF RESERVISTS
OVER THE SELECTED EIGHTEEN MONTH PERIOD

Characteristics	NTC and Comparison Units		Reforger and Comparison Units		Blazing Trails and Comparison Units	
	Unit	Component	Unit	Component	Unit	Component
Black	23.56	20.04	25.47	21.51	30.09	27.57
Nonblack	27.32	23.53	28.31	22.57	31.45	25.44
Officer	24.30	20.13	22.47	13.80	36.27	21.09
Enlisted	26.06	22.40	28.28	23.28	30.59	26.51
Age ≥ 40	15.27	12.28	17.96	13.00	20.93	13.69
Age < 40	27.82	24.00	29.78	24.33	33.15	28.64
Single	30.38	26.44	33.72	27.90	37.30	33.06
Married	22.65	19.14	22.21	17.28	25.18	19.50
Nonhigh school	31.44	26.82	37.05	30.52	36.29	32.60
High school	24.19	20.80	24.61	19.61	28.81	23.32
Category I, II	26.21	22.41	25.02	18.97	30.03	22.33
Category III	24.66	20.95	28.54	23.73	29.67	25.70
Category IV	33.20	31.74	33.90	30.08	31.47	28.87
0 ≤ YOS < 3	45.62	40.72	57.52	49.65	41.15	37.27
3 ≤ YOS < 6	27.90	24.23	27.86	22.50	40.14	35.59
6 ≤ YOS < 11	26.43	22.02	26.80	22.02	30.18	25.44
11 ≤ YOS < 20	15.25	13.03	15.15	10.80	18.35	12.75
20 ≤ YOS	17.65	13.50	19.52	13.23	27.11	19.06
NTC/Reforger/Blazing Trails	29.95	25.46	28.45	23.31	31.58	27.35
Comparison	22.58	19.56	26.69	21.02	30.57	24.91

particular characteristic shown but all the other characteristics that may be related to it. For example, the attrition rate shown for those 40 years or older is not attributable merely to age alone, but to the combined effects of age, marital status, experience and other variables that may be related to age. The last rows of the table repeat the aggregated attrition rates for the NTC/Reforger/Blazing Trails units and the comparison units to provide a kind of a benchmark against which the other rates can be compared.

The primary conclusions that can be drawn from the table are:

- Older, married personnel and those with between 11 and 20 years of service tend to have much lower rates of attrition; this is true across all samples.

- Blacks also have lower rates of attrition although this is not true in the Blazing Trails sample. The same anomaly is also found with respect to officers in this sample, where the separation rate from the unit is much higher for officers than enlisted personnel. This may partly be a result of a poor choice of comparison units. As we show later, the comparison units selected for Tennessee had an extraordinarily large proportion of officers.

- Previous research has shown that education and mental category as measured by the scores on the Armed Forces Qualifying Test are inversely related to attrition. This pattern is evident here as well where high school nongraduates and those in Category IV tend to have consistently higher rates of attrition across all samples.

- The group with the highest attrition rate is the zero to three years of service group. Their attrition rates vary betwen 37 to 57 percent. Again this is consistent across all samples. We had offered some reasons earlier why junior enlisted personnel might feel constrained to separate from the reserve. They face high fixed costs of participation and their net return from reserve service is only about 40 cents on the dollar. In addition, they tend to be the ones with fewer years of experience in the civilian labor market with lower job security and a greater propensity for conflicts with employers. There is also other research on nonprior service individuals that shows that this age-group tends to change jobs and to move more frequently than older individuals; all these reasons would tend to cause separation.

- That there is considerable movement of personnel among reserve and Guard units is amply evidenced by the fact that there are significant differences in attrition from the unit and the component across all groups.

The rates presented above represent the gross effect on attrition of each characteristic. In order to estimate the net effect, we need to estimate mutivariate models of attrition.

EMPIRICAL MODEL

Empirically, the attrition process is summarized by a dichotomous dependent variable that categorizes individuals as stayers or leavers. The outcome variable is defined as:

Y_{it} = 0, if individual *i* stayed through time period *t* and
1, if individual *i* separated during time period *t*.

The conditional logistic regression (logit) model is an appropriate choice for the functional form, since it restricts the predicted value of the dependent variable to zero and one. This model relates the separation decision of the i^{th} individual, Y, to a vector of characteristics for that individual, X_i. The assumed relation is:

$$Y_i = p(X_i) + \varepsilon_i$$

where

$$p(x_i) = P[Y_i = 1|x_i] = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_k x_{ik})}}$$

k denotes the number of characteristics measured for each individual, and $\beta_0, \beta_1, \ldots, \beta_K$ are the parameters of the model to be estimated.

Two estimation methods are commonly used to estimate the parameters in studies of this type: conditional maximum likelihood estimation and discriminant function analysis. Since several empirical studies report similar estimates with both methods,[4] we chose the cheaper, discriminant function method.[4]

---

[4]See Haggstrom (1983); Chow and Polich (1980); Halperin et al. (1971).

[5]The linear discriminant specification of a logistic attrition model is ln $P(Y_i)/(1 - P(Y_i = x\beta$; i.e., the natural logarithm of the odds ratio is a linear function of x. The estimated coefficients are derived by rescaling the ordinary least squares (OLS) coefficients relating Y and x. In other words, one simply computes a linear probability function by regression Y_i on x_i, using OLS. Then one can obtain the discriminant function estimates α and β as: $\beta = (n/SSE) * \beta$ and $\alpha = \log(P_1/P_2) + (n/SSE)(\alpha - 0.5) + n(n_1^{-1} - n_2^{-1})/2$ where $\alpha\backslash 037\beta$ = the OLS intercept and estimated coefficient; n = number of observations; SSE = residual sum of squares from the OLS regression; n_1 = number of observations for which the dependent variable has the value 1; n_2 = $n - n_1$; P_1 = proportion of individuals in the target population for which Y has the value 1. (If observations are drawn at random from the target population, one can estimate P_1 using n_1/n, and $P_2 = 1 - P_1$.)

EMPIRICAL RESULTS

In estimating the models, we used two definitions of attrition and two time periods:

(a) Losses from the *unit* over an eighteen month period encompassing one year prior to the date of the exercise and six months subsequent to it.

(b) Losses from the *component* over the same eighteen month period. Transfers are thus excluded in this definition.

(c) Losses from the *unit* over the longer-run encompassing the period one year prior to the date of the exercise till the end of FY86.

(d) Losses from the *component* over this longer-run period. Once again, transfers are excluded in this definition.

The independent variables are dichotomous, equal to one if the individual has the defining characteristic, zero otherwise. Since discriminant function regression coefficients have no easy interpretation, the results are transformed and presented as attrition probabilities. These probabilities, calculated from the regression coefficients are:

$$P(x_i) = \frac{1}{1 + e^{-(a + \sum_j b_j x_{ij})}}$$

where $P(x_i)$ = probability of attrition of a specific reservist i
X_{ij} = values of the explanatory variable j for reservist i
b_j = estimated coefficients for the X_j,

These probabilities represent a convenient and useful summary of the regression model effects.

Table 3.18 presents estimation results of the short-run basic attrition model. The table entries are estimated attrition probabilities for an individual with the designated characteristics. In this and subsequent tables, a reference individual is defined and the attrition probability calculated for that individual. Attrition probabilities are then calculated for an individual who differs from that reference individual in one characteristic, holding all others constant at the reference category values.

For each of the three samples (NTC, Reforger and Blazing Trails), the first column under each heading of Table 3.18 shows unit attrition probabilities; the second column presents attrition probabilities from the component. The table is a convenient and useful way of comparing the net

Table 3.18

PROBABILITY OF ATTRITION FROM THE UNIT AND COMPONENT OVER AN EIGHTEEN MONTH TIME PERIOD, ALL STATES COMBINED

Independent Variables	Dependent Variable: Attrition over the eighteen month period from the: NTC Units		Reforger Units		Blazing Trails Units	
	Unit	Guard	Unit	Guard	Unit	Guard
Reference group[a]	0.21	0.18	0.22	0.17	0.21	0.15
Black	0.17**	0.14**	0.18**	0.14**	0.19	0.15
Officer	0.20**	0.16	0.20	0.12**	0.31**	0.15
Age ≥ 40	0.17**	0.15*	0.22	0.16	0.19	0.12**
Single	0.20	0.17	0.22	0.16	0.25**	0.18**
High school nongraduate	0.30**	0.25**	0.31**	0.24**	0.28**	0.23**
Category I, II	0.25**	0.22**	0.23	0.17	0.24*	0.17*
Category IV	0.32**	0.32**	0.28**	0.23**	0.21	0.16
0 ≤ YOS < 3	0.43**	0.40**	0.59**	0.52**	0.30**	0.24**
3 ≤ YOS < 6	0.20	0.18	0.22	0.16	0.29**	0.22**
11 ≤ YOS < 20	0.13**	0.11**	0.13**	0.09**	0.14**	0.10**
20 ≤ YOS	0.15**	0.12**	0.17*	0.11**	0.21	0.16
Exercise unit	0.28**	0.23**	0.22	0.18	0.21	0.16
Army Reserve	--[b]	--[b]	0.26**	0.23**	0.27**	0.22**

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in a Guard unit not attending NTC/Reforger/Blazing Trails exercises.

[b]No Army Reserve units in the sample.

*Significant at .05 level.

**Significant at .01 level.

effects of various characteristics, including that of being involved in the training exercise, not only within each sample but across samples as well. Looking at unit attrition in the NTC sample first, we find that the attrition probability is 0.21 over this eighteen month period period for the reference individual, who is an enlisted reservist, nonblack, age less than 40 years, married, high school graduate, Category III with six to eleven years of service and serving in a Guard non-NTC unit. If this individual were black, instead of nonblack, the attrition probability would be significantly lower: 0.17. Statistically significant and large differences occur in attrition rates among lower quality individuals (high school nongraduates, Category IV) and those with fewer than three years of service. These groups all have much higher attrition rates (between 0.30 - 0.43) as compared to 0.21 for our reference individuals. Surprisingly, so do Category I,II recruits. On the other hand, blacks and those with greater experience (with greater than eleven years of service) have significantly lower attrition rates.

From the viewpoint of the study, it is the effect of being in an NTC unit that we are primarily interested in measuring. Holding everything else constant, the attrition probability for our reference individual rises from 0.21 to 0.28 for those serving in NTC units, an increase of almost 33 percent. The difference is statistically significant at a 0.01 level of significance.

Turning now to attrition from the Guard, we find, as expected, that attrition probabilities for all groups are somewhat smaller. Basically the same patterns show up: the greatest differences in attrition rates are evidenced by lower quality, and lower experience individuals who have considerably higher attrition rates, when compared to the reference group. The probability of attrition is 0.23 for our reference individual in an NTC unit as compared to 0.14 in a non-NTC unit. This difference is significant at a 0.01 level of significance. This represents an increase in attrition of 28 percent.

It is instructive to compare these results with those of the Reforger and Blazing Trails samples. First, the attrition probabilities for the reference individuals (nonblack, enlisted, age less than 40 years, married, high school graduate, Category III with six to eleven years of service, serving in a Guard unit not attending the training exercise), are remarkably similar across the three samples. The effects of other characteristics are also fairly consistent. For example, lower quality individuals and those with fewer than three years of service have significantly higher unit attrition probabilities in both the Reforger and Blazing Trails samples. Blacks also have lower attrition rates, although the effect is not statistically signifcant in the Blazing Trails sample. Officers also have significantly higher attrition probabilities in the Blazing Trails sample, although, as mentioned before, this may be partly due to a poor choice of comparison units for this sample.

There are two important differences that must be noted between these two models and the NTC results. First, unlike the large and significant difference we found between the NTC and the comparison units in terms of attrition probability, we find almost no difference between the Reforger and Blazing Trails units and their comparison units, after controlling for

demographic and experience characteristics. In other words, identical individuals serving in these units versus the comparison units would have very similar attrition rates. Thus, a tentative conclusion that could be drawn from these data alone is that while the NTC experience causes the units to suffer large and significant losses, other things equal, there is little or no difference between those selected for the Reforger and the Blazing Trails exercises and those that are not. Second, because the units attending Reforger and Blazing Trails exercises were from both components, we explicitly tested for differences in attrition between the two components by including a separate dummy variable for the Army Reserve. We find that there appear to be significant differences (between 19-46 percent) between similar individuals in the Army Guard and Army Reserve units. These differences represent the net effect of the component, after controlling for everything else. There is other evidence to suggest that attrition rates in the Army Reserve tend to be higher both for nonprior and prior service individuals although the reasons for such a difference are somewhat unclear.

BASIC MODEL, WITH INTERACTION TERMS

In an attempt to see whether the effect of being in a unit attending the exercises was distributed evenly across all reservist groups or fell disproportionately on some, we reestimated the basic attrition model with interaction terms that allowed for differential effects among the various groups within such units. This allows us to compare attrition probabilities for each reservist subgroup. The results are given in Table 3.19. Looking at the first column, showing the results for the NTC sample, we find that an individual with the reference characteristics has a unit attrition probability of 0.21, while a similar individual who is serving in an NTC unit has an attrition probability of 0.27. Assume now that this individual, holding all *other* characteristics, is a Category IV recruit. Then his estimated unit attrition probability for non-NTC unit is 0.29 and for NTC unit is 0.47. For Guard attrition, the corresponding numbers are 0.28 and 0.46. For both unit and Guard attrition, all groups tested have higher attrition if they are serving in NTC units, but only Category IV is statistically significant (and Category I,II for Guard attrition). Category IV individuals have unusually high attrition levels in NTC units. Other groups having very large attrition differences include high school nongraduates, Category I, II individuals and those with fewer than three years of service. The effects of all other variables are the same as in the basic regression.

Turning now to the Reforger sample, we find that there appear to be no consistent patterns between individuals in the non-Reforger units and those in the Reforger units. The basic relationships seen earlier in the eighteen month model hold: high school nongraduates, Category IV individuals and those with fewer than three years of service have markedly higher attrition probabilities than the reference individual but the differences between these individuals and their counterparts in the Reforger units are statistically insignificant. Indeed, the only difference that is statistically significant is associated with those with 20 years or more of service, who presumably choose retirement at this point rather than go on the Reforger exercise. The effects seen earlier with regard to the Reforger unit dummy itself still hold:

Table 3.19

PROBATILITY OF ATTRITION FROM THE UNIT AND THE COMPONENT OVER THE SELECTED EIGHTEEN MONTH PERIOD, ALL STATES COMBINED

Independent Variables	Dependent Variable: Attrition over the eighteen month period from the:					
	NTC Units		Reforger Units		Blazing Trails Units	
	Unit	Guard	Unit	Guard	Unit	Guard
Reference group[a]	0.21	0.19	0.20	0.15	0.23	0.17
Black	0.17**	0.14**	0.16*	0.13	0.19**	0.15
Officer	0.22	0.19	0.16	0.09**	0.32**	0.15
Age ≥ 40	0.17*	0.15	0.20	0.17	0.20	0.13**
Single	0.21	0.18	0.20	0.15	0.26	0.20
High school nongraduate	0.30**	0.25**	0.29**	0.21**	0.26	0.20*
Category I, II	0.24	0.20	0.22	0.16	0.25	0.19
Category IV	0.29**	0.28**	0.26*	0.23**	0.29*	0.22*
0 ≤ YOS < 3	0.41**	0.38**	0.56**	0.52**	0.31**	0.24**
3 ≤ YOS < 6	0.20	0.18	0.23	0.17	0.30**	0.23**
11 ≤ YOS < 20	0.13**	0.12**	0.13**	0.18**	0.16**	0.11**
20 ≤ YOS	0.15*	0.12**	0.16	0.11	0.27	0.21
Exercise unit	0.27**	0.22	0.24	0.19	0.19	0.14
Army Reserve	--[b]	--[b]	0.24	0.20**	0.30**	0.24**

Table 3.19 (Continued)

PROBABILITY OF ATTRITION FROM THE UNIT AND THE COMPONENT OVER THE SELECTED EIGHTEEN MONTH PERIOD, ALL STATES COMBINED

Independent Variables	Dependent Variable: Attrition over the eighteen month period from the: NTC Units Unit	NTC Units Guard	Reforger Units Unit	Reforger Units Guard	Blazing Trails Units Unit	Blazing Trails Units Guard
Interaction Terms If in an sample unit and having the following characteristic:						
Black	0.22	0.16	0.20	0.15	0.20*	0.16
Officer	0.23	0.17	0.23	0.15	0.30	0.14
Age ≥ 40	0.23	0.18	0.23	0.17	0.19	0.12
Single	0.25	0.20	0.23	0.19	0.24	0.17
High school nongraduate	0.39	0.30	0.33	0.28	0.31**	0.27**
Category I, II	0.34	0.29*	0.24	0.19	0.23	0.16
Category IV	0.47*	0.46**	0.30	0.24	0.17**	0.13*
0 ≤ YOS < 3	0.53	0.48	0.62	0.55	0.29	0.25
3 ≤ YOS < 6	0.27	0.22	0.21	0.17	0.28	0.23
11 ≤ YOS < 20	0.16	0.13	0.14	0.11	0.12	0.08
20 ≤ YOS	0.19	0.14	0.17*	0.12	0.16	0.12
Army Reserve	--b	--b	0.27	0.26	0.23	0.19

aThe reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

bNo Army Reserve units in the sample.

*Significant at .05 level.

**Significant at .01 level.

there is a small increase in the attrition probability among individuals who are in the Reforger units but this difference is not statistically significant. The same patterns hold true for component attrition, with one exception. The Army Reserve dummy is significant in this regression, indicating that Army Reserve units have a higher attrition rate, other things equal, than Guard units. However, the Army Reserve units who attended the Reforger exercise appear not to be different than those who did not: while they do have a higher attrition rate (0.26 compared to 0.20), the difference is not significant in a statistical sense.

The Blazing Trails results are similar to those of the Reforger sample, although there are some differences. In terms of unit attrition, officers,[6] Category IV individuals, those with fewer years of service have markedly higher attrition probabilities while blacks and those with between eleven and twenty years of service have lower attrition probabilities. Being in a Blazing Trails unit *decreases* the probability of attrition, although this difference is not statistically significant. On the other hand, individuals in Army Reserve units have a considerably higher attrition probability than similar individuals in Army Guard units (0.30 compared to 0.23 for unit attrition; 0.24 versus 0.17 for component attrition). The interaction terms show that surprisingly, Category IV individuals in Blazing Trails units have a siginificantly lower attrition probability, while blacks and high school nongraduates have somewhat higher attrition probabilities than those in units not attending the exercises. These patterns are repeated in the component attrition model. However, there the difference between blacks in Blazing Trails and non-Blazing Trails units does not exist suggesting that blacks tend to transfer in higher proportions from Blazing Trails units.

A tentative conclusion one can draw from these models estimated over the selected eighteen month time period is that being in an NTC unit clearly increases the probability of attrition while being in units attending the Reforger or Blazing Trails exercises does not. Among all the groups of reservists in the NTC sample, the one big difference we find consistently is for Category IV individuals who appear to be affected by the NTC experience disproportionately when compared to other groups. In terms of the other groups, the attrition patterns are fairly consistent and plausible, with high school nongraduates and those with less experience tending to leave at considerably higher rates across all units. Those with between 11 and 20 years of service, not unexpectedly, have much lower attrition probabilities; this is, of course, a self-selected group that has consciously chosen to stay because of a taste for military service. In addition, at this point, the vesting in the retirement system acts as a powerful incentive to remain.

[6]We had explained earlier that this may be due to a poor choice of comparison units.

LONG-RUN RESULTS

As we mentioned earlier, one of the important questions we sought to answer is whether being selected for intense training exercises may have longer-run effects that are not captured by the eighteen month time period cutoff used above. Our aggregated attrition and transfer rates suggested that the NTC units, at least, continued to suffer high rates of attrition into the future. We examine here patterns of long-run attrition for both the NTC and Reforger units by estimating the basic model, with and without interactions, for the time period for which we have data on these units. As Table 3.14 showed, the data on most of the NTC units is between one to three years after the NTC rotation. For the Reforger units, we have data extending from one-and-one-half to two years subsequent to the date that the units attended the Reforger exercise. The Blazing Trails units attended in 1986; as such, we have no comparable longer-run data on them. This sample is, therefore, omitted from the estimation.

We must warn that the results are not directly comparable across the two samples (NTC and Reforger) because the time periods are not identical. Nevertheless, one can compare these results to those of the eighteen month time period and see whether the same patterns continue and by what order of magnitude they differ. Table 3.20 presents the estimation results for both the short-run (repeated from Table 3.18) and long-run in order to facilitate such comparisons.

The unit attrition probability of individuals with reference characteristics increases from 0.21 in the short-run to 0.31 in the longer-run; for attrition from the component, the comparable numbers are 0.18 to 0.24. The difference between individuals in NTC units and similar individuals in non-NTC units in terms of attrition probabilities remains similar in the two models. For example, NTC units have a 33 percent higher probability of attrition in the short-run; over the longer-run, the difference is 32 percent. For Guard attrition, the relative differences are 28 percent in the short-run and 25 percent in the long-run. This has some serious implications for policymakers when considering implementing increased training requirements without concomitant changes in reserve compensation or the incentive structure. Clearly, the one piece of information that is missing here is the supply side of the picture: if units are successful in recruiting, then the NTC experience may produce a net gain as less desirable individuals are replaced by perhaps higher quality and better motivated individuals who appreciate the higher level of unit readiness achieved through NTC. On the other hand, if units are left scrambling to fill these slots and are operating on a long-term basis with less than full strength, then the higher levels of unit training readiness may well be dissipated because of the lower levels of personnel readiness.

The effects of the other variables in the longer-run appear to mimic those in the short-run, with an interesting exception. Officers appear to have high unit attrition probabilities in the long-run, but lower Guard attrition probabilities suggesting that they tend to transfer more readily. Note that this effect is for the non-NTC units. Other than that, high school

Table 3.20

LONG-RUN PROBABILITY OF ATTRITION FROM THE UNIT AND THE ARMY NATIONAL GUARD, ALL STATES COMBINED: ONE YEAR BEFORE NTC TO SEPTEMBER 1986

Independent Variables	Dependent Variable: Attrition from the Unit till end of FY1986	Dependent Variable: Attrition from the Guard till end of FY1986
Reference group[a]	0.31	0.24
Black	0.23**	0.18**
Officer	0.38**	0.19**
Age ≥ 40	0.24**	0.21*
Single	0.32**	0.24
High school nongraduate	0.39**	0.32**
Category I, II	0.36**	0.28**
Category IV	0.40**	0.35**
0 ≤ YOS < 3	0.46**	0.43**
3 ≤ YOS < 6	0.31	0.26
11 ≤ YOS < 20	0.22**	0.15**
20 ≤ YOS	0.28**	0.16**
NTC Unit	0.41**	0.30**

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

*Significant at .05 level.

**Significant at .01 level.

nongraduates, Category I,II and Category IV individuals, those with fewer than three years of service all have markedly higher attrition probabilities while older, more experienced individuals and blacks have much lower attrition probabilities. That Category I,II individuals have a *higher* attrition probability compared to Category III is a little puzzling and runs contrary to other evidence we have found in both prior and nonprior research. However, a plausible explanation may be that such individuals are likely to have a wider set of job and promotion opportunities available to them and, therefore, perhaps a lower need for the additional reserve income, leading to separation.

The Reforger results mirror some of these same patterns: long-run attrition probabilites are higher than those in the short-run (0.22 and 0.17 versus 0.35 and 0.23 for unit and component attrition respectively) and

individual groups of reservists are characterized by much the same patterns as we saw in the NTC sample. However, the most important difference is in the effect of being in a unit selected for Reforger. Here, we find that the attrition probability actually is lower for individuals in such units, and although the difference is small, it is statistically significant, at least for unit attrition. Surprisingly, for the unit attrition equation, we find that Army Reserve units tend, in the longer-run, to have lower attrition probabilities, a complete reversal of the effect we found earlier in the short-run model. However, in terms of component attrition, the two probabilities are identical, suggesting that individuals in Guard units tend to transfer more than their counterparts in the Army Reserve units.

As before, we reestimated the long-run model with interaction terms that allow us to examine whether groups of reservists show disproportionately higher (or lower) attrition probabilities i.e. whether the effect of being in a unit selected for the NTC or Reforger exercises falls disproportionately on selected groups. Table 3.21 presents these results. The same basic patterns are evident with one surprise. The NTC units still show significantly higher attrition probabilities, an increase of 18 percent over non-NTC units. However, the difference is not significant in terms of component attrition suggesting that not all individuals in the NTC units are singled out for separation but certain selected groups, primarily Category IV individuals. The Reforger results are the same as seen earlier with the exception that Army Reserve units tend to have lower attrition probabilities than Guard units (among those not selected to participate in the Reforger exercise). However, there is little difference between individuals in Reforger units and those in non-Reforger units. Other than that, we find the same high attrition probabilities for those with fewer than three years of service and for high school nongraduates.

We must caveat these results by pointing out that the validity of these comparisons depends to some degree on our assumption that the units we have selected for the comparison sample are similar to those attending the NTC/Reforger/Blazing Trails exercises. While we have controlled for demographic and some service-related variables in the regression models, if the units differ in some unmeasured way, then our estimates of the effects of NTC/Reforger/Blazing Trails are being measured with some unknown degree of error. Even allowing for this, we believe that the results, backed by the evidence gathered from the case-studies point to the fact that the NTC experience does lead to higher attrition and these effects may not be confined to the immediate time period before and after NTC. There appears to be some plausible evidence that the Reforger and Blazing Trails units, on the other hand, do not have the same experience. Their attrition rates appear to be close to, or at least, not markedly different from, other units in the same state not selected to participate in these exercises.

Table 3.21

LONG-RUN PROBABILITY OF ATTRITION FROM THE UNIT AND THE ARMY NATIONAL GUARD, ALL STATES COMBINED: ONE YEAR BEFORE NTC TO SEPTEMBER 1986

Independent Variables	Dependent Variable: Attrition over the eighteen month period from the: NTC Units		Reforger Units	
	Unit	Guard	Unit	Guard
Reference group[a]	0.33	0.25	0.32	0.20
Black	0.23**	0.18**	0.24**	0.16*
Officer	0.41**	0.22	0.35	0.12**
Age ≥ 40	0.26**	0.23	0.27	0.20
Single	0.35	0.26	0.33	0.21
High school nongraduate	0.40**	0.32**	0.41**	0.27**
Category I, II	0.38**	0.28	0.36	0.20
Category IV	0.41**	0.34**	0.37*	0.27**
0 ≤ YOS < 3	0.47**	0.42**	0.69**	0.60**
3 ≤ YOS < 6	0.31	0.26	0.38	0.26**
11 ≤ YOS < 20	0.22**	0.16**	0.26*	0.13**
20 ≤ YOS	0.29*	0.18**	0.31	0.17
Exercise unit	0.39*	0.28	0.35	0.26*
Army Reserve	--[b]	--[b]	0.23**	0.18
Interaction Terms If in an sample unit and having the following characteristic:				
Black	0.30	0.23	0.30	0.20
Officer	0.46	0.21	0.38	0.21
Age ≥ 40	0.30	0.23	0.35	0.24
Single	0.40	0.28	0.34	0.25
High school nongraduate	0.49	0.38	0.46	0.38
Category I, II	0.45	0.34	0.34	0.24
Category IV	0.51	0.48*	0.36	0.26
0 ≤ YOS < 3	0.57	0.51	0.68	0.60
3 ≤ YOS < 6	0.40	0.31	0.36	0.28
11 ≤ YOS < 20	0.29	0.18	0.22*	0.15
20 ≤ YOS	0.38	0.19	0.30	0.18
Army Reserve	--[b]	--[b]	0.29	0.28

aThe reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

bNo Army Reserve units in the sample.

*Significant at .05 level.

**Significant at .01 level.

IV. STATE-SPECIFIC ATTRITION ESTIMATION RESULTS

We turn now to state-specific attrition estimation results. This allows us both to examine differences between units attending the NTC/Reforger/Blazing Trails exercises and comparison units within a particular state as well as across states. Because there is such a plethora of results to be discussed, we report the results separately for the three different samples. In each case, we first present comparative profiles of NTC/Reforger/Blazing Trails units and comparison units within each state by selected characteristics. Next, we analyze patterns of attrition and transfers. The final section in each subsection describes the regression results.

THE NTC SAMPLE

Comparative Profile of NTC and Comparison Units

Table 4.1 makes clear that there are broad similarities in the types of personnel across units in different state, but also some notable differences. Overall, the units tend to be largely nonblack, younger than 40 years, high school graduates, Category III, with between 3 to 20 years of service. However, even this profile varies in one or the other respect. Georgia and Louisiana have much higher proportions of blacks. Louisiana also has much higher proportions of singles and high school nongraduates. Minnesota has a much higher percentage of Category I and Category II reservists and high school graduates. The distribution by years of service shows that the Georgia units tend to have fewer personnel with 0-3 years of service, while Louisiana has a much higher proportion of these individuals.

Turning now to a comparison of NTC and comparison units within states, we find that the groups are fairly alike in a number of respects with some striking disparities. Comparison units in Alabama have a somewhat higher proportion of blacks, singles and older reservists; Georgia NTC units have a somewhat higher proportion of singles, blacks and nongraduates as well as those with lower overall experience (less than six years of service); Louisiana comparison units have a higher proportion of those with less experience; North Carolina comparison units have both a higher proportion of blacks and those with greater experience. Indeed, given the constraints of finding comparison units that (a) were in the same state, (b) were in existence a year before the NTC date, and (c) had similar functions, missions and authorized strength, it is surprising the two groups are not more dissimilar.

Table 4.1

A COMPARATIVE PROFILE OF NTC AND COMPARISON UNITS BY STATE AND SELECTED CHARACTERISTICS

Characteristic	Alabama		Georgia (1-121)		Georgia (2-121)		Louisiana (3-156)		Louisiana (2-156)		Minnesota		North Carolina	
	NTC Units	Comparison Units	NTC Units	Comparison Units	NTC Units	Comparison Units	NTC Units	Comparison Units	NTC Units	Comparison Units	NTC Units	Comparison Units	NTC Units	Comparison Units
Percent black	13.3	20.2	51.1	38.9	45.4	38.7	40.5	63.0	45.0	60.7	--	--	12.8	48.1
Percent officer	8.3	7.4	6.3	6.4	5.8	6.2	8.8	7.3	4.3	7.9	6.9	6.5	6.8	4.2
Percent age $\geq$ 40	17.1	22.2	14.0	20.3	18.9	20.6	11.9	8.5	7.4	8.2	16.5	13.0	16.9	19.9
Percent single	30.0	34.9	40.6	30.0	36.3	30.1	22.4	22.5	59.9	59.9	49.5	43.4	35.5	29.9
Percent nonhigh school graduates	29.3	25.5	30.0	28.0	30.6	27.4	44.0	57.5	23.2	20.8	17.5	11.4	26.0	21.5
Percent Category I, II	33.9	25.5	27.3	30.3	30.8	30.7	29.7	26.8	27.2	26.0	50.6	56.1	34.2	29.8
Percent Category III	60.6	63.3	66.2	63.9	63.9	63.4	63.3	57.4	68.9	62.2	45.8	40.6	60.2	63.4
Percent Category IV	5.5	11.2	6.5	5.8	5.3	5.9	7.0	15.8	3.9	11.8	3.6	3.3	5.6	6.8
Percent 0 $\leq$ YOS[a] < 3	11.8	10.6	8.1	5.2	10.1	5.5	15.4	13.7	26.1	20.4	16.1	12.1	14.4	9.9
Percent 3 $\leq$ YOS < 6	26.1	25.1	30.6	19.9	21.5	19.7	32.2	39.0	36.1	33.8	30.9	28.5	32.3	20.2
Percent 6 $\leq$ YOS < 11	28.5	22.0	28.9	29.8	30.4	30.2	29.9	28.6	21.8	27.7	24.7	25.2	23.5	22.7
Percent 11 $\leq$ YOS < 20	24.6	26.5	26.1	37.8	32.0	37.4	18.6	16.1	13.0	15.2	22.5	26.5	21.4	37.7
Percent 20 $\leq$ YOS	9.0	15.7	6.3	7.3	6.0	7.3	3.8	2.7	3.0	2.9	5.8	7.6	8.3	9.4
(N)	(533)	(490)	(838)	(1,084)	(771)	(1,079)	(655)	(1,089)	(875	(1,191)	(933)	(722)	(804)	(806)

[a] YOS = years of service.

Patterns of Attrition/Transfers Among NTC and Comparison Units by State

The overall pattern of attrition from the Guard and transfers to other Guard units is presented in Table 4.2. Despite differences in the profile of units across states, the pattern that emerges from the data is strikingly clear: NTC units have significantly higher unit and Guard attrition than comparison units over the same period, without an exception. The relative differences in unit attrition between the NTC units and the non-NTC units over the eighteen month time period range from 20 percent to over 100 percent in North Carolina. There appears to be substantial evidence to suggest that the NTC experience leads to higher unit and Guard attrition in every case.

Looking at attrition over the longer-run, we must warn that the rates are of course, not directly comparable across the states because we have varying lengths of history on each unit. Attrition rates in general tend to be very high: between 40 to 50 percent of personnel who were present one year before the NTC date leave or transfer within (on average) one to three years after NTC. An important question from a policy standpoint is whether most of these separations take place before or after the NTC training. If most separations take place after the NTC date, then the increased level of training readiness that the unit gains through attending NTC is mostly dissipated. If, however, these separations occur before the NTC date, as a conscious policy on the part of the unit to gear up for NTC, then this puts a different complexion on the problem. These issues are addressed in the following chapter.

The relative difference in overall unit attrition over the longer-run is approximately 30 percent in most states. The unit with the lowest level of percentage increase is the Georgia 2-121. In Alabama and North Carolina, a substantial number appear to choose to transfer to other Guard units; the proportion of transfers is almost double that of comparison units. North Carolina displays the largest percentage difference in unit attrition; however, one must be cautious in interpreting the difference too literally because the comparison unit may differ in some unknown manner from the NTC unit and this unmeasured factor may be influemcing this result.

We turn now to the state-disaggregated regression results in order both to get a statistical estimate of the magnitude of the NTC effect as well as to compare these across states.

Estimation Results

Tables 4.3-4.4 present what was earlier labeled the basic attrition model, for two dependent variables defined earlier as:

(a) Attrition from the unit over the NTC period, encompassing one year prior to the NTC date and six months subsequent to it

Table 4.2

ATTRITION/TRANSFERS IN NTC VERSUS COMPARISON UNITS OVER AN EIGHTEEN MONTH PERIOD AND LONG-RUN, BY STATE

	Separated from the Guard Unit (%)	Transferred to Another Guard Unit (%)	Overall Unit Attrition (%)	Still Remaining in Original Unit (%)	(N)
Selected Eighteen Month Period					
Alabama					
NTC units	18.76	8.26	27.02	72.98	(533)
Comparison unit	17.35	5.10	22.45	77.55	(490)
Georgia					
First NTC unit	22.70	4.54	27.24	72.76	(837)
Comparison unit	18.71	3.22	21.93	78.06	(1,085)
Second NTC unit	19.84	4.67	24.51	75.49	(771)
Comparison unit	18.72	3.62	22.34	77.66	(1,079)
Louisiana					
First NTC unit	28.66	6.93	35.59	64.41	(649)
Comparison unit	21.92	4.47	26.39	73.61	(1,095)
Second NTC unit	26.74	1.94	28.68	71.32	(875)
Comparison unit	23.34	2.85	26.20	73.80	(1,191)
Minnesota					
NTC unit	33.45	0.33	33.78	66.22	(894)
Comparison unit	21.45	0.28	21.73	78.27	(704)
North Carolina					
NTC unit	26.74	7.22	33.96	66.04	(804)
Comparison unit	13.03	1.61	14.64	85.36	(806)
Long-Run					
Alabama					
NTC unit	23.08	18.01	41.09	58.91	(533)
Comparison unit	20.61	10.00	30.61	69.39	(490)
Georgia					
First NTC unit	36.32	10.63	46.95	53.05	(837)
Comparison unit	28.29	8.30	36.59	63.41	(1,085)
Second NTC unit	29.31	8.17	37.48	62.52	(771)
Comparison unit	26.32	7.97	34.29	65.71	(1,079)
Louisiana					
First NTC unit	35.13	14.33	49.46	50.54	(649)
Comparison unit	28.58	8.13	36.71	63.29	(1,095)
Minnesota					
NTC unit	45.41	6.04	51.45	48.55	(894)
Comparison unit	33.52	5.11	38.63	61.37	(704)
North Carolina					
NTC unit	30.10	11.69	41.79	58.21	(804)
Comparison unit	15.51	3.85	19.36	80.64	(806)

(b) Attrition from the Guard over the same period.

Looking at Table 4.3, there appears to be some consistency and diversity in the regression results across states:

- Other things equal, blacks in every state tested have a lower propensity to separate from the unit, as do those with 11-20 years of service. We had conjectured earlier that this latter effect may be due partly to self-selection and partly to the vesting structure of the retirement system which holds individuals in until 20 years of service.

- Lower quality reservists (Category IV, high school nongraduates) tend to have significantly higher attrition probabilities, as do singles in most states (somewhat surprisingly).

- Other things equal, Category I, II have higher attrition probabilities than Category III. This result may be due to the increased civilian job responsibilities, promotion opportunities and wages of higher aptitude individuals, and the associated greater potential for job conflicts or decreased need for reserve income.

- With the exception of Louisiana, officers have a much lower probability of attrition from the unit. The earlier case studies showed an officer exodus after NTC for the Louisiana unit.

- Probably the single biggest difference is found among the attrition probabilities for groups distinguished by years of service. Those with fewer than three years of service have markedly higher attrition probabilities. This is not surprising given our earlier evidence on the very low real return to reserve service accruing to such individuals.

- In all cases membership in the NTC units--other things equal--raises the probability of unit attrition for the reference individual. Attrition probabilities are statistically significant in four out of seven cases and increase unit attrition for a typical individual for NTC units in the range of 20 to 50 percent (except for the second Georgia unit).

Turning now to attrition from the Guard (Table 4.4), we find that the basic patterns hold: blacks, officers and higher experience recruits have lower attrition probabilities while lower quality and younger reservists have significantly higher attrition rates than the reference group. Once again, NTC units have generally higher separation rates in all units than comparison units, holding all other factors constant. These results are statistically significant for four of the seven units. The relative difference in attrition rates ranges from 0 percent (Georgia second unit) to 80 percent in North Carolina.

Table 4.3

PROBABILITY OF ATTRITION FROM THE UNIT OVER AN EIGHTEEN MONTH PERIOD BY STATE: THE NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit over the eighteen month period						
	Alabama	Georgia 1-121	Georgia 2-121	Louisiana 3-156	Louisiana 2-156	Minnesota	North Carolina
Reference group[a]	0.14	0.23	0.26	0.21	0.26	0.15	0.14
Black	0.10	0.15**	0.23	0.20	0.22	--[b]	0.11
Officer	0.13	0.16	0.13**	0.24	0.33	0.12	0.11
Age ≥ 40	0.13	0.18	0.20	0.13*	0.19	0.14	0.11
Single	0.21**	0.25	0.26	0.17	0.21*	0.13	0.13
High school nongraduate	0.21**	0.25	0.26	0.27*	0.36**	0.40**	0.22
Category I, II	0.15	0.24	0.37**	0.30**	0.28	0.21**	0.16
Category IV	0.22	0.24	0.25	0.37**	0.39**	0.28*	0.32
0 ≤ YOS < 3	0.51**	0.89**	0.59**	0.31**	0.26	0.67**	0.30*
3 ≤ YOS < 6	0.17	0.24	0.20	0.19	0.28	0.08**	0.19
11 ≤ YOS < 20	0.08*	0.13**	0.13**	0.19	0.25	0.07**	0.07*
20 ≤ YOS	0.11	0.17	0.18	0.23	0.26	0.06**	0.11
NTC unit	0.17	0.28*	0.26	0.31**	0.31	0.23**	0.25*

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table 4.4

PROBABILITY OF ATTRITION FROM THE COMPONENT OVER AN EIGHTEEN MONTH PERIOD BY STATE: THE NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the Guard over the eighteen month period						
	Alabama	Georgia 1-121	Georgia 2-121	Louisiana 3-156	Louisiana 2-156	Minnesota	North Carolina
Reference group[a]	0.08	0.20	0.22	0.19	0.22	0.15	0.11
Black	0.05*	0.14**	0.18	0.17	0.19	--[b]	0.09
Officer	0.07	0.18	0.13*	0.22	0.21	0.11	0.09
Age ≥ 40	0.08	0.17	0.18	0.10*	0.17	0.14	0.08
Single	0.14*	0.18	0.19	0.17	0.17*	0.13	0.10
High school nongraduate	0.11	0.21	0.21	0.23	0.30**	0.39**	0.18**
Category I, II	0.12	0.20	0.30*	0.27**	0.21	0.21**	0.13
Category IV	0.26**	0.23	0.26	0.38**	0.35**	0.27*	0.36**
0 ≤ YOS < 3	0.45**	0.86**	0.62**	0.24	0.25	0.67**	0.25**
3 ≤ YOS < 6	0.11	0.23	0.20	0.16	0.26	0.08**	0.16*
11 ≤ YOS < 20	0.05*	0.12**	0.12**	0.18	0.21	0.07**	0.06**
20 ≤ YOS	0.04	0.13	0.12	0.25	0.21	0.05**	0.11
NTC unit	0.09	0.23	0.22	0.26**	0.26*	0.22**	0.20**

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Longer-Term Patterns of Attrition

The earlier section, for reasons of comparability, has laid emphasis on an eighteen month time period: one year prior to the NTC date and almost six months subsequent to it. However, in the case of six out of seven units, the exception being the second Louisians unit, our records span a longer history. Of particular interest, as we mentioned earlier when discussing the aggregated results, is the question of whether the NTC "effect" identified earlier actually continues beyond the period immediately after NTC.

This section looks at the longer-term effect for the six NTC units by analyzing the differences in attrition probabilities over time. Tables 4.5-4.6 present the estimated regression results from the basic attrition model using (a) attrition from the unit over the full period for which we have data (one year prior to NTC to the end of FY1986: September 1986); and (b) attrition from the Guard over the same period.

As expected, all the attrition probablities are higher here than in the short-run models. Unit attrition probabilities for the reference group show a relative increase of between 25 to 100 percent, this latter in Minnesota, where the attrition probability for the reference group more than doubles from 0.15 to 0.32. The basic pattern remains the same with some striking differences: officers, for example, experience a marked increase in attrition over the longer run, going from having significantly lower attrition in the short-run to higher than the reference group in the longer-run. As seen earlier, Category IV and those with fewer years of experience tend to have considerably higher propensities to separate from the unit, as do Category I,II recruits. Blacks and older, more experienced personnel tend to have lower longer-run attrition rates, the same pattern we found in the short-run.

The longer-run Guard attrition results (Table 4.6) are very similar with one exception: officers now appear to have *lower* attrition probabilities suggesting that officers tend to transfer to other units rather than separate completely from the component.

Turning now to the "NTC effect", it is helpful to summarize the short- and long-run effects in Table 4.7. Recall that the attrition probabilities shown are those for reference individuals (nonblack, enlisted, age less than 40 years, married, high school graduate, Category III with six to eleven years of service) serving in non-NTC units and similar individuals serving in NTC units.

The comparisons are interesting: the difference in unit attrition between the NTC and comparison units widens over time in almost every case. Alabama shows the largest percentage increase between short- and long-run attrition probabilities, from 21.4 percent to 41.7 percent. This is true of Guard attrition as well. However, we find that the difference in Guard attrition between NTC and comparison units appears to narrow over time for three out of the six units, suggesting that individuals in NTC units tend to transfer to other units over time.

Table 4.5

LONGER-RUN PROBABILITY OF ATTRITION FROM THE UNIT FOR SELECTED UNITS: THE NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit till September 1988					
	Alabama	Georgia 1-121	Georgia 2-121	Louisiana 3-156	Minnesota	North Carolina
Reference group[a]	0.24	0.38	0.36	0.31	0.32	0.18
Black	0.20	0.25**	0.31	0.27	--[b]	0.17
Officer	0.26	0.43	0.34	0.38	0.53**	0.26
Age ≥ 40	0.22	0.29*	0.27*	0.18**	0.31	0.14
Single	0.32*	0.47**	0.38	0.29	0.33	0.16
High school nongraduate	0.30	0.38	0.37	0.42**	0.46**	0.26**
Category I, II	0.29	0.38	0.48**	0.41**	0.37	0.21
Category IV	0.31	0.37	0.33	0.49**	0.40	0.32**
0 ≤ YOS < 3	0.58**	0.82**	0.58**	0.36	0.80**	0.35**
3 ≤ YOS < 6	0.25	0.43	0.35	0.29	0.29	0.23
11 ≤ YOS < 20	0.15**	0.28**	0.24**	0.32	0.18**	0.09**
20 ≤ YOS	0.21	0.41	0.41	0.41	0.16**	0.17
NTC unit	0.34**	0.49**	0.39	0.46**	0.44**	0.35**

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table 4.6

LONGER-RUN PROBABILITY OF ATTRITION FROM THE COMPONENT FOR SELECTED UNITS: THE NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the Guard till September 1986					
	Alabama	Georgia 1-121	Georgia 2-121	Louisiana 3-156	Minnesota	North Carolina
Reference group[a]	0.10	0.30	0.30	0.25	0.25	0.13
Black	0.07*	0.22**	0.24*	0.23	--[b]	0.12
Officer	0.08	0.24	0.15**	0.25	0.18	0.14
Age ≥ 40	0.10	0.27	0.24	0.19	0.27	0.10
Single	0.16*	0.35	0.31	0.23	0.23	0.11
High school nongraduate	0.14	0.32	0.31	0.33**	0.44**	0.20**
Category I, II	0.16*	0.29	0.38*	0.31*	0.31*	0.15
Category IV	0.26**	0.31	0.27	0.43**	0.36	0.35**
0 ≤ YOS < 3	0.56**	0.78**	0.57**	0.28	0.79**	0.30**
3 ≤ YOS < 6	0.15	0.36	0.31	0.23	0.24	0.19*
11 ≤ YOS < 20	0.06**	0.20**	0.17**	0.20	0.12**	0.07**
20 ≤ YOS	0.07	0.21	0.24	0.21	0.10**	0.13
NTC unit	0.12	0.37*	0.32	0.32**	0.34**	0.23**

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table 4.7

COMPARISON OF SHORT-RUN AND LONG-RUN ATTRITION PROBABILITIES OF SIMILAR INDIVIDUALS IN NTC AND COMPARISON UNITS, BY STATE

Attrition Probatilities	Alabama	Georgia 1-121	Georgia 2-121	Louisiana 3-156	Minnesota	North Carolina
Unit Attrition Probabilities[a]						
Short-Run						
Comparison units	0.14	0.23	0.26	0.21	0.15	0.14
NTC units	0.17	0.28*	0.26	0.31**	0.23**	0.28**
(Percent difference)	(21.4)	(21.7)	(0.0)	(47.6)	(34.8)	(100.0)
Long-Run						
Comparison units	0.24	0.38	0.36	0.31	0.32	0.18
NTC units	0.34**	0.49**	0.39	0.46**	0.44**	0.35**
(Percent difference)	(41.7)	(28.9)	(8.3)	(48.4)	(37.5)	(94.4)
Guard Attrition Probabilities[a]						
Short-Run						
Comparison units	0.08	0.20	0.22	0.19	0.15	0.11
NTC units	0.09	0.23	0.22	0.26**	0.22**	0.20**
(Percent difference)	(12.5)	(15.0)	(0.0)	(36.8)	(46.7)	(81.8)
Long-Run						
Comparison units	0.10	0.30	0.30	0.25	0.25	0.13
NTC units	0.12	0.37*	0.32	0.32**	0.34**	0.23**
(Percent difference)	(20.0)	(23.3)	(6.7)	(28.0)	(36.0)	(76.9)

[a]Nonblack, enlisted, age less than 40 years, married, high school graduate, Category III with six to eleven years of service.

*Significant at 0.05 level.

**Significant at 0.01 level.

Estimation Results: The Basic Model, with Interaction Terms

As in an earlier section, we introduced a number of interaction terms between being in an NTC unit and other demographic characteristics to see if any particular groups within NTC units could be identified as disproportionately prone to attrition. Partly because these results mirror those discussed above in terms of the effects of most variables on attrition and partly to avoid overwhelming the reader with details, we report the tables in the Appendix and content ourselves with a brief discussion of the major points here. It is difficult to identify any one group as being peculiarly prone to attrition: lower-quality groups (Category IV, nonhigh school graduates) do emerge as having significantly higher attrition, although the statistical significance occurs only in a few cases. The one consistent significant result, with perhaps one exception, is the markedly higher attrition rate for those with less than 3 years of service. Being in an NTC unit clearly makes a difference but the sample sizes for subgroups may be too small to see a pattern. Perhaps the only consistent pattern to emerge from the NTC interaction terms is that those with fewer than three years of service and lower quality reservists tend to have disproportionately high rates of attrition, as do Category I,II recruits.

THE REFORGER SAMPLE

Comparative Profile of Reforger and Comparison Units

Table 4.8 presents a profile of Reforger and comparison units by state so we can compare the two. Again, as we found for the NTC sample, there are some broad similarities but also some notable differences. In general, the unit personnel overall are younger than 40 years, single, high school graduates, Category III, and with between 3 to 20 years of service. The Reserve units tend to have higher proportions of blacks and those with fewer than three years of service than the Guard units. Pennsylvania is a real outlier in terms of the very high proportion of Category I,II enlistees in both the Reforger and comparison units. The distribution by years of service looks quite similar across the states with some minor differences.

If we compare Reforger and comparison units within states, we find that the groups are fairly similar, although there are some disparities. For example, comparison units in Alabama and Wisconsin have a much higher proportion of blacks (also true for Pennsylvania), singles (Alabama only) and Category IV personnel; South Carolina comparison units tend to be somewhat older, and more experienced; Iowa comparison units have a higher proportion of singles, and those with fewer years of service. On the whole, however, given the constraints in selecting comparison units, the sample is fairly well-matched.

Table 4.8

A COMPARATIVE PROFILE OF REFORGER AND COMPARISON UNITS
BY STATE AND SELECTED CHARACTERISTICS

	Reforger, Army National Guard and Army Reserve Units											
	Alabama (Reserve)		Iowa (Guard)		Massachusetts (Guard)		Pennsylvania (Reserve)		South Carolina (Guard)		Wisconsin (Guard)	
Characteristics	Reforger	Comparison	Reforger	Comparison	Reforger	Comparison	Reforger	Comparison	Reforger	Comparison	Reforger	Comparison
Percent black	47.8	73.6	--[a]	7.7	3.3	13.7	29.7	50.6	28.3	38.8	--[a]	22.8
Percent officer	5.8	2.8	5.5	4.4	7.2	9.2	20.4	26.7	5.5	7.3	6.7	7.9
Percent age $\geq$ 40	13.0	8.3	14.8	11.6	13.0	15.1	22.1	19.6	23.3	28.2	14.0	14.6
Percent Single	43.8	65.0	40.8	47.8	63.8	61.2	58.9	60.3	31.4	26.3	46.2	44.5
Percent high school nongraduate	21.8	27.1	14.1	19.8	35.9	40.0	9.1	11.0	27.3	18.1	22.3	34.2
Percent Category I, II	26.4	15.4	48.9	51.7	39.9	32.8	62.4	58.1	31.0	31.9	48.1	42.6
Percent Category III	45.7	44.2	50.5	46.3	54.4	57.9	32.9	36.2	65.8	60.5	45.3	43.2
Percent Category IV	27.9	40.4	0.6	2.0	5.7	9.3	4.7	5.7	3.2	7.6	6.6	14.2
Percent 0 $\leq$ YOS < 3	20.5	18.9	12.9	17.9	18.1	13.2	23.5	19.4	7.1	5.4	11.8	9.2
Percent 3 $\leq$ YOS < 6	20.5	27.6	31.9	33.3	40.1	36.1	19.4	28.3	31.5	16.7	24.4	25.0
Percent 6 $\leq$ YOS < 11	26.8	29.9	21.4	18.8	18.8	22.5	22.9	23.1	21.9	25.5	31.9	36.6
Percent 11 $\leq$ YOS < 20	26.8	21.3	26.6	24.2	18.4	23.6	28.0	23.5	27.2	30.3	25.1	25.3
Percent 20 $\leq$ YOS	5.4	2.4	7.3	5.8	4.7	4.6	5.9	5.7	12.4	14.0	6.8	4.0
(N)	(254)	(224)	(674)	(207)	(708)	(590)	(489)	(494)	(622)	(791)	(946)	(328)

[a]Too small a sample size to be included separately.

Patterns of Attrition/Transfers Among Reforger and Comparison Units by State

Table 4.9 presents attrition and transfer rates from the unit and the component by state over the selected eighteen month period as well as the longer-run, for the three units for whom we have a longer history.

Unlike the patterns we saw for the NTC units, we find no consistent patterns in the attrition experience of the Reforger units versus the comparison units. In some states (Alabama, Massachusetts, South Carolina), the Reforger units do have a higher overall unit attrition rate and most of the difference comes from separations rather than transfers. On the other hand, in the other three states, Reforger units have lower rates, and in the case of Iowa, markedly so. In the longer-run, which again is not directly comparable because of the uneven lengths of history, the attrition rates rise but again the pattern is not consistent: the Iowa Reforger unit displays an almost 25 percent lower unit attrition rate than that of the comparison unit while the other two Reforger units (in Massachusetts and South Carolina) show a small (approximately 10 percent) increase in unit attrition.

We turn now to an examination of the estimation results of the basic model, without interaction terms, for attrition from the unit and the Guard, for individual states in the Reforger sample.

Estimation Results

Tables 4.10-4.11 present results from the basic attrition model, for the two dependent variables defined earlier.

The major patterns that emerge from an examination of the two tables are:

- In almost every case, (with the exception of Wisconsin where the proportion of blacks is very small and Iowa where the small sample size precluded the inclusion of this variable in the regression), blacks have a lower propensity to separate from the unit and the component, as do those with 11-20 years of service. These effects are similar to those we found for the NTC sample.

- Again, mirroring the NTC sample results, lower quality reservists (Category IV, high school nongraduates) tend to have significantly higher attrition probabilities as do Category I, II enlistees.

- With the exception of the Alabama Reserve unit and the Wisconsin Guard unit, officers have a much lower probability of attrition from the unit. In the Wisconsin Guard, this effect is reversed and particularly significant.

- As with the NTC sample, the single biggest difference is found among the attrition probabilities for groups distinguished by years of service, with those with fewer than three years of service having markedly higher attrition probabilities.

Table 4.9

ATTRITION/TRANSFERS IN REFORGER VERSUS COMPARISON UNITS
OVER AN EIGHTEEN MONTH PERIOD AND LONG-RUN, BY STATE

	Separated from the Guard Unit (%)	Transferred to Another Guard Unit (%)	Overall Unit Attrition (%)	Still Remaining in Original Unit (%)	(N)
Selected Eighteen Month Period					
Alabama					
Reforger unit	32.74	4.48	37.22	62.78	(223)
Comparison unit	27.06	6.27	33.33	66.67	(255)
Iowa					
Reforger unit	20.36	2.52	22.88	77.12	(673)
Comparison unit	21.15	6.73	27.88	72.12	(208)
Massachusetts					
Reforger unit	26.69	7.91	34.60	65.40	(708)
Comparison unit	22.71	7.46	30.17	69.83	(590)
Pennsylvania					
Reforger unit	26.84	3.28	30.12	69.88	(488)
Comparison unit	26.27	4.84	31.11	68.89	(495)
South Carolina					
Reforger unit	18.52	3.06	21.58	78.42	(621)
Comparison unit	14.01	2.78	16.79	83.21	(792)
Wisconsin					
Reforger unit	22.09	7.19	29.28	70.72	(946)
Comparison unit	23.17	8.84	32.01	67.99	(328)
Long-Run					
Iowa					
Reforger unit	29.12	11.00	40.12	59.88	(673)
Comparison unit	32.69	20.19	52.88	47.12	(208)
Massachusetts					
Reforger unit	40.40	12.99	53.39	46.61	(708)
Comparison unit	33.73	15.59	49.32	50.68	(590)
South Carolina					
Reforger unit	24.96	6.44	31.40	68.60	(621)
Comparison unit	19.19	8.84	28.03	71.97	(792)

Table 4.10

PROBABILITY OF ATTRITION FROM THE UNIT OVER AN EIGHTEEN MONTH PERIOD BY STATE: THE REFORGER SAMPLE

	Dependent Variables:					
	Reforger Units			Attrition from the unit eighteen months		
Independent Variables	Alabama Reserve	Iowa Guard	Massachusetts Guard	Pennsylvania Reserve	South Carolina Guard	Wisconsin Guard
Reference group[a]	0.45	0.16	0.25	0.25	0.14	0.31
Black	0.27**	--[b]	0.22	0.25	0.11	0.39
Officer	0.50	0.09	0.14*	0.20	0.11	0.56**
Age ≥ 40	0.32	0.16	0.22	0.30	0.14	0.33
Single	0.48	0.16	0.23	0.24	0.13	0.28
High school nongraduate	0.53	0.22	0.29	0.46**	0.23**	0.35
Category I, II	0.57	0.20	0.23	0.26	0.17	0.28
Category IV	0.41	0.16	0.43**	0.29	0.38**	0.26
0 ≤ YOS < 3	0.56	0.80*	0.79**	0.53**	0.47**	0.52**
3 ≤ YOS < 6	0.36	0.12	0.23	0.29	0.24**	0.33
11 ≤ YOS < 20	0.28*	0.11	0.17*	0.16*	0.07**	0.20**
20 ≤ YOS	0.24	0.10	0.19	0.16*	0.11	0.35
Reforger unit	0.45	0.14	0.27	0.24	0.15	0.28

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table 4.11

PROBABILITY OF ATTRITION FROM THE COMPONENT OVER AN EIGHTEEN MONTH PERIOD BY STATE: THE REFORGER SAMPLE

	Dependent Variables:					
	Reforger Units			Attrition from the Guard eighteen months		
Independent Variables	Alabama Reserve	Iowa Guard	Massachusetts Guard	Pennsylvania Reserve	South Carolina Guard	Wisconsin Guard
Reference group[a]	0.34	0.10	0.19	0.22	0.11	0.24
Black	0.19**	--[b]	0.19	0.21	0.09	0.32
Officer	0.21	0.05	0.11*	0.16	0.07	0.21
Age ≥ 40	0.27	0.09	0.17	0.24	0.11	0.23
Single	0.39	0.09	0.18	0.20	0.10	0.24
High school nongraduate	0.40	0.17*	0.22	0.35*	0.20**	0.28
Category I, II	0.49	0.12	0.17	0.22	0.13	0.18
Category IV	0.30	0.10	0.41**	0.25	0.40**	0.19
0 ≤ YOS < 3	0.52*	0.69**	0.69**	0.53**	0.34**	0.45**
3 ≤ YOS < 6	0.28	0.09	0.15	0.27	0.20**	0.24
11 ≤ YOS < 20	0.23	0.07	0.13*	0.14*	0.05**	0.11**
20 ≤ YOS	0.19	0.08	0.12	0.11*	0.07	0.18
Reforger unit	0.35	0,11	0.22	0.24	0.12	0.24

[a]The reference group consists of nonblack, enlisted, age less than 40 years married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

- However, unlike the NTC sample, being a member of a unit selected to attend the training exercise (Reforger in this case) does not have any effect on attrition. In no case is the variable significant; in some cases, Reforger units show a decrease in attrition probabilities.

Longer-Term Patterns of Attrition

For three out of the six units in the Reforger sample, we have data extending beyond the immediate NTC period. We estimated the longer-run attrition models for these three states for unit and component attrition separately. The results are reported in Table 4.12.

Unit attrition probabilities for the reference group are almost double those in the short-run model. Guard attrition probabilities are between 50 to 80 percent higher in the long run, which in the case of these three units ranges from 21 to 24 months after the date of the Reforger exercise. The patterns seen earlier in the short-run model are repeated here, with one small exception. In the longer-run, the Iowa Reforger unit has a significantly lower unit attrition probability than its counterpart. However, this does not hold for attrition from the Guard where the two probabilities are now equal, suggesting that a much higher proportion of individuals in the comparison unit chose to transfer over this time period.

The major reason for estimating the model with the interaction terms was to analyze the pattern of attrition within the training exercise units in instances where there appeared to be a large "training exercise" effect, to see if there were groups of reservists on whom these effects fell disproportionately. Because in the Reforger sample, there appeared to be little or no such effect, and because the interaction model did not add much to the analysis, we do not report these results.

THE BLAZING TRAILS SAMPLE

Comparative Profile of Blazing Trails and Comparison Units

Table 4.13 presents a demographic and experience profile of the Blazing Trails units and their selected counterparts in each state. Alabama and Georgia units are almost overwhelmingly black, in sharp contrast to the units in the Reforger and NTC samples. They also tend to have a high proportion of singles, Category IV and less experienced personnel. The Blazing Trails units and the comparison units in these two states tend to be quite similar. The Kentucky Reserve comparison unit has a higher proportion of blacks than the Kentucky Blazing Trails unit and a much greater experience profile. The Missouri Guard unit (first unit) has a very small proportion of blacks (less than one percent) in contrast to its comparison unit, 16 percent of whom are black. The comparison unit also has a higher proportion of high school nongraduates, and a smaller proportion of Category I,II personnel. Its members also have less experience than the Blazing Trails unit. The second

Table 4.12

LONGER-RUN PROBABILITIES OF ATTRITION FROM THE UNIT AND THE COMPONENT FOR SELECTED UNITS: THE REFORGER SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit one year before Reforger till September 1986			Attrition from the component one year before Reforger till September 1986		
	Iowa Guard	Massachusetts Guard	South Carolina Guard	Iowa Guard	Massachusetts Guard	South Carolina Guard
Reference group[a]	0.43	0.47	0.26	0.18	0.33	0.16
Black	--[b]	0.42	0.18**	--[b]	0.31	0.11*
Officer	0.43	0.49	0.33	0.10	0.21**	0.09*
Age ≥ 40	0.34	0.41	0.24	0.16	0.30	0.14
Single	0.45	0.43	0.25	0.18	0.31	0.14
High school nongraduate	0.52	0.52	0.39**	0.23	0.39	0.29**
Category I, II	0.16	0.47	0.31	0.19	0.31	0.16
Category IV	--[b]	0.60*	0.45**	0.18	0.51**	0.37**
0 ≤ YOS < 3	0.84**	0.82**	0.71**	0.81**	0.69**	0.56**
3 ≤ YOS < 6	0.44	0.44	0.40**	0.24	0.29	0.32**
11 ≤ YOS < 20	0.35	0.40	0.16**	0.14	0.22**	0.09**
20 ≤ YOS	0.43	0.50	0.24	0.20	0.25	0.17
Reforger unit	0.34*	0.48	0.26	0.18	0.38	0.17

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, service in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Missouri Blazing Trails unit is somewhat closer in profile to the comparison unit although here too, there are some differences. The Tennessee comparison unit is a real outlier in terms of proportions of officers. This was an unfortunate choice of a comparison unit but we were somewhat constrained in our choice. The Tennessee units also differ in terms of the distribution by mental category.

Patterns of Attrition/Transfers Among Blazing Trails and Comparison Units by State

Attrition and transfer rates from the unit and the component by state over the selected eighteen month period are presented in Table 4.14. As mentioned earlier, all the Blazing Trails units went in 1986, as such we have no longer-run history on any of these units, similar to what we had with the NTC and the Reforger samples.

In only one state, Kentucky, do we find a higher attrition rate for the Blazing Trail unit as compared to its comparison unit, and even here, the difference is small. In all other instances, the Blazing Trails units tend to have equal or somewhat lower attrition rates than their counterparts. In three units (Alabama, Georgia, and the Missouri second unit), transfer rates are higher than for comparison units. However, even this pattern is not consistent across all states.

The next section focuses on the estimation results of the basic model, without interaction terms, for attrition from the unit and the Guard, for individual states in the Blazing Trails sample.

Estimation Results

Tables 4.15-4.16 present results from the basic attrition model, for the two dependent variables defined earlier: attrition from the unit and from the Guard over the selected eighteen month period.

The results are similar to those found in the NTC and Reforger samples in that the major differences in attrition are evidenced by year of service groups: those with less than six years of service have very high attrition probabilities while those with between eleven and twenty years of service have significantly lower probabilities of attrition , compared to the reference group (those with between six and eleven years of service). Lower quality reservists also have higher attrition probabilities; however, the differences are significant in three out of six cases and then only for high school nongraduates. The same patterns are evident in the model of attrition from the component. Officers, much as we found earlier, tend to transfer at greater rates than the enlisted; their attrition probabilities tend to be considerably higher in the unit equation and much lower than the reference group in the Guard attrition equation.

Table 4.13

A COMPARATIVE PROFILE OF BLAZING TRAILS AND COMPARISON UNITS BY STATE AND SELECTED CHARACTERISTICS

Characteristic	Characteristics of Blazing Trails Units - Army Reserve and Army National Guard Units											
	Alabama Reserve		Georgia Reserve		Kentucky Reserve		Missouri Guard				Tennessee Reserve	
	Panama Units	Comparison Units	Panama Units	Comparison Units	Panama Units	Comparison Units	First Honduras Units	Comparison Units	Second Honduras Units	Comparison Units	Panama Units	Comparison Units
Percent black	71.6	64.7	80.1	74.7	10.8	30.0	--[a]	15.9	19.7	16.4	35.2	34.0
Percent officer	5.2	5.9	4.3	5.6	6.0	4.9	4.6	7.4	7.2	6.3	4.8	22.1
Percent age $\geq$ 40	10.5	8.1	7.8	12.7	5.1	13.6	28.4	19.8	19.1	19.3	16.9	21.0
Percent single	61.8	62.5	56.7	54.9	63.3	60.5	29.1	39.9	46.1	40.7	49.6	51.9
Percent nonhigh school graduates	18.3	21.1	15.7	13.6	24.9	25.2	23.9	32.0	25.0	30.6	27.7	11.7
Percent Category I, II	20.2	19.5	20.0	27.8	30.9	27.2	49.3	39.5	38.4	39.8	27.7	48.7
Percent Category III	56.9	54.1	47.7	51.8	47.7	52.6	47.0	54.0	51.7	54.5	52.1	42.2
Percent Category IV	22.9	26.4	32.3	20.4	21.4	20.2	3.7	6.5	9.9	5.7	20.2	9.1
Percent 0 $\leq$ YOS < 3	24.2	25.2	12.1	11.3	38.0	25.1	12.2	13.7	16.9	18.4	18.0	14.3
Percent 3 $\leq$ YOS < 6	19.3	28.6	19.2	22.5	25.3	22.2	18.6	21.1	19.4	19.2	18.8	17.6
Percent 6 $\leq$ YOS < 11	25.0	30.2	42.6	31.0	24.7	25.5	20.4	32.7	32.6	33.1	27.4	27.7
Percent 11 $\leq$ YOS < 20	28.1	14.0	26.2	29.6	9.2	23.5	35.1	26.7	23.1	25.3	30.2	29.3
Percent 20 $\leq$ YOS	4.0	1.8	--[a]	--[a]	1.9	3.7	13.8	5.8	6.5	5.4	5.1	9.9
(N)	(793)	(493)	(141)	(71)	(566)	(243)	(749)	(1,186)	(629)	(1,217)	(1,052)	(567)

[a] Too small a sample size to be included separately.

Table 4.14

ATTRITION/TRANSFERS IN BLAZING TRAILS VERSUS COMPARISON UNITS OVER AN EIGHTEEN MONTH PERIOD, BY STATE

Type of Unit	Separated from the Guard Unit (%)	Transferred to Another Guard Unit (%)	Overall Unit Attrition (%)	Still Remaining in Original Unit (%)	(N)
Alabama					
Panama units	33.17	4.28	37.45	62.35	(793)
Comparison units	37.73	2.23	39.96	60.04	(493)
Georgia					
Panama units	18.44	4.26	22.70	77.30	(141)
Comparison units	25.00	1.47	26.47	73.53	(68)
Kentucky					
Panama units	34.40	2.48	36.88	63.12	(564)
Comparison units	31.02	4.08	35.10	64.90	(245)
Missouri					
First Honduras units	22.19	7.22	29.41	70.59	(748)
Comparison units	22.33	8.76	31.09	68.91	(1,187)
Second Honduras units	19.55	4.45	24.01	75.99	(629)
Comparison units	21.77	2.96	24.73	75.27	(1,217)
Tennessee					
Panama units	28.80	2.57	31.37	68.63	(1,052)
Comparison units	25.04	6.53	31.57	68.43	(567)

Table 4.15

PROBABILITY OF ATTRITION FROM THE UNIT OVER AN EIGHTEEN MONTH PERIOD BY STATE: THE BLAZING TRAILS SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit over the eighteen month period					
	Alabama	Georgia	Kentucky	Missouri 1st Unit	Missouri 2nd Unit	Tennessee
Reference group[a]	0.36	0.27	0.30	0.23	0.19	0.21
Black	0.24**	0.13	0.35	0.20	0.21	0.21
Officer	0.50	0.61	0.18	0.34*	0.30*	0.33**
Age ≥ 40	0.28	0.17	0.19	0.22	0.18	0.19
Single	0.34	0.35	0.36	0.29**	0.22	0.25
High school nongraduate	0.43	0.43	0.34	0.32**	0.26**	0.28*
Category I, II	0.42	0.33	0.35	0.24	0.21	0.25
Category IV	0.36	0.18	0.32	0.43**	0.14	0.20
0 ≤ YOS < 3	0.62**	0.28	0.30	0.36**	0.23	0.29*
3 ≤ YOS < 6	0.54**	0.39	0.29	0.27	0.22	0.41**
11 ≤ YOS < 20	0.23**	0.20	0.22	0.14**	0.12**	0.15*
20 ≤ YOS	0.27	--[b]	0.38	0.16	0.17	0.28
Blazing Trails unit	0.38	0.28	0.29	0.26	0.19	0.22

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table 4.16

PROBABILITY OF ATTRITION FROM THE COMPONENT OVER AN EIGHTEEN MONTH PERIOD BY STATE: THE BLAZING TRAILS SAMPLE

Independent Variables	Dependent Variable: Attrition from the Guard over the eighteen month period					
	Alabama	Georgia	Kentucky	Missouri 1st Unit	Missouri 2nd Unit	Tennessee
Reference group[a]	0.36	0.20	0.326	0.16	0.16	0.14
Black	0.23**	0.15	0.31	0.17	0.21	0.16
Officer	0.28	0.05	0.12*	0.11	0.16	0.21
Age ≥ 40	0.31	0.11	0.15	0.15	0.12	0.10
Single	0.34	0.25	0.35*	0.19	0.19	0.17
High school nongraduate	0.44	0.43	0.34	0.23**	0.24**	0.22**
Category I, II	0.40	0.29	0.32	0.17	0.17	0.17
Category IV	0.37	0.13	0.27	0.38**	0.10*	0.14
0 ≤ YOS < 3	0.63**	0.19	0.25	0.25**	0.23*	0.24**
3 ≤ YOS < 6	0.56**	0.45	0.24	0.17	0.18	0.34**
11 ≤ YOS < 20	0.21**	0.09	0.17	0.10**	0.11**	0.10*
20 ≤ YOS	0.21	--[b]	0.33	0.11	0.13	0.23
Blazing Trails unit	0.36	0.16	0.25	0.20*	0.15	0.17

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Generally, Blazing Trails units appear to have equal or very slightly higher attrition probabilities than their counterparts. In only one case, that of attrition from the Guard for the first Missouri unit, do we find a significantly higher attrition probability.

The model with interaction terms, again not reported for the same reason as the Reforger sample, does not show much beyond the fact that personnel with fewer years of service tend to leave in disproportionately high numbers from both Blazing Trails and comparison units. Singles also appear to have high attrition probabilities.

The next section examines the question of the timing of attrition for the three samples.

V. TIMING AND CAUSES OF ATTRITION

From a policy standpoint, an important question is whether higher attrition is due to pruning of marginal performers or loss of proficient soldiers. Here we present two analysis which shed light on this question. If the higher rate of attrition experienced by the units selected for more intense types of training, such as NTC in particular, is the result of a conscious, deliberate policy on the part of the units to gear up for NTC by getting rid of marginal performers, then the retention losses may actually improve total unit readiness. However, if individuals are themselves making the decisions to separate because of lost income, lost vacation, or employer/family conflicts, then the high rate of attrition presages problems for the reserve components should such a policy be implemented on a wider basis. Pruning of marginal performers probably occurs prior to NTC, while ETS losses of capable soldiers probably occurs more after NTC. In this section, we examine the *timing* of attrition by estimating multivariate models of time-related dependennt variables. We also summarize results from a companion survey analysis. We summarize results which are related to the reason for losses.

DEFINING THE DEPENDENT VARIABLES

The dependent variables for the models discussed below were created as shown below. First, the entire eighteen month period was divided into three time periods, consisting of six months each. These were somewhat arbitrarily labelled "early", "middle" and "late" to distinguish them from one another. Second, three separate analysis files were built, based on these three time periods. The file for the early period consisted of everyone who was present in an NTC or comparison unit one year before NTC. The dependent variable, "attrition from the early period" was defined as follows: an individual was regarded as having separated from the unit if he left during this first six month time period only; anyone leaving later was coded as having survived to the next period. Thus, individuals were coded as 0 or 1 depending on whether they remained during the first six months or separated. Third, for the next two periods, an analogous procedure was followed. Only individuals surviving the early period formed the data base for the middle period model (and of course, by extension, only individuals surviving the middle period formed the data base for the late period). The dependent variables for the two periods were coded as 0 or 1 depending on whether the individual survived or separated during these two time periods respectively.

In a sense, these dependent variables can be thought of as capturing conditional probabilities: what are the odds that an individual will survive the next six months, *given that he has survived thus far*? This allows us to examine particular patterns of attrition during each of the time periods and to compare them across periods. If the "gearing up" hypothesis is correct, then we would expect perhaps lower-quality or younger personnel to have significantly higher attrition in the early period, other things equal, with

more random patterns of attrition later. If, however, the separations tend to be individual-initiated, then we would expect higher-quality individuals, and those with more experience also to leave in high numbers. If the NTC experience (or the expectation of being sent again to NTC) caused the separations, we would expect to see a more deliberate pattern of attrition in the last six months as individuals, having undergone the rigors of NTC and its concomitant increased front-end training time, decide to leave. If separations are indeed taking place subsequent to the NTC date, then this has serious consequences for the unit, as the high level of training readiness achieved through the NTC experience is dissipated through the loss of trained personnel.

ESTIMATION RESULTS

Table 5.1 presents results for the models of time-dependent attrition from the unit for the three samples. In each case, results for the early (one year before the date of the exercise to six months prior to it), middle (six months prior to the date of the exercise up to the date itself) and late (from the date of the exercise to six months after it) periods are reported.

Examining the NTC sample first, we find that attrition seems to be particularly high among lower-quality and less experienced personnel and (somewhat surprisingly) singles. These patterns are evident in the NTC units also where Category IV personnel and high school nongraduates have markedly higher attrition probabilities, lending some credence to the "gearing-up" hypothesis. What is somewhat disturbing is the significantly higher attrition probability of Category I,II personnel also during these periods. Blacks, older and more experienced personnel tend to have lower attrition probabilities in both the non-NTC and NTC units. Officers, however, appear to have very high attrition probabilities of leaving in the late period from non-NTC units. In the NTC units, those with fewer than 6 years of service tend to have significantly higher probabilities of leaving during the late period suggesting that the NTC experience tends to affect them disproportionately. We had advanced some arguments earlier why younger enlisted personnel might be particularly prone to attrition. For example, they tend to take home only $0.45 for every dollar of reserve income. In addition, they have less job seniority and security and are liable to more employer and family conflicts.

Apart from the patterns within NTC and non-NTC units, we find that NTC units, even controlling for all other variables, have a higher rate of attrition than non-NTC units. This effect is particularly marked and significant in the middle period; this lends more support to the opposite hypothesis, that individuals knowing some of the costs they are facing because of the increased training time requirements decide to separate from the unit.

In the Reforger sample, we find fairly consistent patterns across time. Category IV personnel, high school nongraduates, and those with fewer than three years of service have considerably higher attrition probabilities in the non-Reforger units. Being in a Reforger unit by itself does not appear to raise the probability of attrition. However, in the Reforger units, those with fewer than three years of service have a very high probability of

Table 5.1

PROBABILITY OF TIME-DEPENDENT ATTRITION
FROM THE UNIT, ALL STATES COMBINED

	NTC Sample			Reforger Sample			Blazing Trails Sample		
	Attrition During the:			Attrition During the:			Attrition During the:		
	Early Period	Middle Period	Late Period	Early Period	Middle Period	Late Period	Early Period	Middle Period	Late Period
Reference group [a]	0.06	0.06	0.05	0.07	0.05	0.07	0.06	0.08	0.06
Black	0.05*	0.04*	0.04*	0.06	0.04	0.06	0.06	0.09	0.05
Officer	0.05	0.06	0.10**	0.05	0.05	0.09	0.08	0.07	0.26**
Age $\geq$ 40	0.06	0.05	0.04*	0.07	0.08	0.05	0.04	0.07	0.07
Single	0.05**	0.09**	0.06**	0.07	0.06	0.07	0.07	0.10	0.05
High school nongraduate	0.08*	0.08**	0.08	0.09	0.07	0.09*	0.08**	0.07	0.05
Category I, II,	0.08*	0.06	0.06	0.08	0.05	0.08	0.06	0.10	0.07
Category IV	0.15**	0.09*	0.05	0.07	0.14**	0.05	0.07	0.09	0.06
0 $\leq$ YOS < 3	0.19**	0.08	0.07	0.30**	0.10*	0.13**	0.13**	0.10	0.05
3 $\leq$ YOS < 6	0.07	0.05	0.05	0.07	0.06	0.06	0.10**	0.10	0.05
11 $\leq$ YOS < 20	0.04**	0.04*	0.04*	0.03**	0.03*	0.06	0.05	0.04**	0.05
20 $\leq$ YOS	0.04*	0.05	0.05	0.03	0.04	0.08	0.06	0.14	0.07
NTC/Reforger/ Panama unit	0.09	0.10**	0.06	0.08	0.06	0.09	0.07	0.05*	0.04
If in NTC/Reforger/ Panama Unit and:									
Black	0.06	0.09	0.04	0.08	0.05	0.08	0.09	0.05	0.05
Officer	0.07	0.07	0.06	0.06	0.08	0.11	0.08	0.05	0.32
Age $\geq$ 40	0.09	0.08	0.04	0.06	0.07	0.09	0.06	0.05	0.05
Single	0.07	0.09**	0.05	0.08	0.06	0.07	0.08	0.08	0.05
High school nongraduate	0.12	0.16	0.11	0.12	0.06	0.12	0.11	0.11**	0.03
Category I, II	0.11	0.15*	0.06	0.09	0.05	0.09	0.08	0.06	0.04
Category IV	0.43**	0.13	0.06	0.06	0.24	0.05	0.08	0.04	0.02
0 $\leq$ YOS < 3	0.24	0.14	0.17**	0.25	0.27*	0.21	0.17	0.08	0.04
3 $\leq$ YOS < 6	0.10	0.07	0.09*	0.06*	0.07	0.08	0.10	0.07	0.05
11 $\leq$ YOS < 20	0.05	0.05	0.04	0.04	0.04	0.06	0.04	0.03	0.03
20 $\leq$ YOS	0.04	0.05	0.07	0.05	0.04	0.07	0.05	0.05	0.04

[a] The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, category III with six to eleven years of service, serving in non-NTC units.

* Significant at .05 level.

** Significant at .01 level

attrition from the unit during the period immediately preceding the training exercise, again suggesting that these individuals make conscious decisions to leave perhaps because of the costs attendant on going abroad for the Reforger training.

The Blazing Trails results mirror those of the Reforger sample except in a few instances. Here, surprisingly, being in a Blazing Trails unit actually significantly lowers the probability of attrition for reference individuals during the middle period. Also, we find, as with the NTC units in the late period, officers tend to leave during the late period. The magnitude of the effect may be partly driven by a poor choice of comparison units for Tennessee, where the unit had an extraordinarily high proportion of officers. Apart from that, we find much the same patterns: lower-quality personnel and those with less than six years of service have much higher attrition probabilities while more experienced personnel tend to have lower attrition probabilities.

SUMMARY OF SURVEY RESULTS

A companion project was initiated to complement the analysis of computerized loss data presented earlier in this report. The purpose of this project was to determine reasons individuals left Reserve and Guard units. The sample of units chosen for participation was the same units included in the statistical analysis, i.e, units attending NTC, Reforger and Blazing Trails and associated control units. All individuals who left these units in the 18 month period (12 months prior to the exercise until six months after the exercise) were the focus of the study.

Forty-five units were included in the study--seven from NTC, ten from Blazing trails, eleven from Reforger and 17 control units. All units had attended Special exercises or normal two week training during 1984-85 or 1986. In these units 6924 individuals were identified who left the units during the 18 month period. Since these individuals had left units, surveys were administered to one supervisor and one peer of these individuals in July-December, 1987. These surveys identified the individual who had left the unit, and information concerning the circumstances for leaving and the performance of the individual in the unit was sought.

This project supported the sampling and survey design for this analysis. Survey production, administration and initial tabulations of results was done by Data Recognition Corporation.[1] Responses were received from 3289 supervisors and 3560 peers. The response rate was 51 percent of the original sample.

Here we will summarize some of the relevant results from the survey cross-tabulations as they relate to the following questions:

[1] Nogami, Glenda, Horne, David, Hydock, Thomas, Weyrauch, Susan, National Guard and Reserve Attrition Following Extended Annual Training Exercises: A Volume of Cross Tabulations. U.S. Army Research Institute, March 1988.

- Do the survey responses indicate NTC, Blazing Trails or Reforger units have significantly different attrition patterns than their control units?

- Do the cross tabulations provide evidence for differences in reasons for leaving units across Exercise and control units?

- Do cross tabulations provide evidence concerning more pruning of marginal performers in Exercise units than control units?

In general the cross-tabulations of the survey responses points to the following conclusions:

- NTC participation was much more likely to be mentioned as a cause of attrition, than Reforger and Blazing Trails participation by both supervisors and peers.

- Reforger was somewhat more likely to be mentioned as a cause of attrition than Blazing Trails among peers and supervisors.

- Pruning of marginal performers does not appear to be more prevalent among NTC units than associated contol units.

- Pruning of marginal performers does is more prevalent among Reforger and Blazing Trails Units than control units.

- NTC participation significantly increases loss rates due to job-related causes, but does not significantly increase loss rates due to family related causes.

- NTC participation significantly increases loss rates due to poor physical conditioning and overweight

- NTC participation significantly increases losses due to income related reasons

- NTC participation significantly increases losses due to inability to attend additional drills and nonpaid time.

Generally the survey responses support the findings of the statistical loss analysis by supporting the fact that NTC participation causes more losses than either Reforger or Blazing Trails. There is generally less difference in reasons for attrition for Reforger and Blazing Trails units compared to control units than for NTC units and control units. NTC units show clear differences from control units in employer related reasons and income related reasons, but do not show significant differences in family reasons or poor performance in TPU.

Tentative conclusions from the survey data would support the following reasons why NTC units have higher attrition than Reforger and Blazing Trails units:

- More employer related conflicts.
- Loss of Income and vacation days during NTC period.
- More intense train-up period requiring additional time.
- More physical conditioning and overweight problems.

The data does not support family related problems or pruning of marginal performers as prime determinants of higher attrition in NTC units.

It should be noted here that the absence of family-related losses may simply be the fact that family causes are less likely to be mentioned by those leaving, even though they may exist. Family reasons are less socially acceptable to peers and supervisors, whereas employer reasons are more acceptable. Thus the strong prevalence of employer conflicts may actually be hiding some family related causes.

On the other hand, the absence of evidence for pruning marginal performers is probably accurate since supervisors and peers are in a good position to judge this--as distinct from family reasons. One hypothesis why NTC units seem to actually discharge fewer marginal performers than Reforger and Blazing Trails units is that they may have higher recruiting standards and take in fewer marginal performers. Usually NTC units are elite units who probably do not recruit or keep marginal performers. Other units may have lower standards, and do not get rid of marginal performers until triggered by exercises.

VI. CONCLUSIONS

The major purpose of this study was to determine whether personnel involved in training exercises that involved increased training time had higher attrition, and if so, what were the causes of this higher level of attrition and which groups appeared to be the most affected. Another objective of the study was to compare the experience of units undergoing different types of training exercises to see whether they differed in some way and why. The data base for the study encompassed seven National Guard units that attended NTC, four Army Reserve (three in Alabama) and four Army Guard units that attended Reforger, and seven Army Reserve (three in Alabama) and two Army Guard units that attended the Blazing Trails exercises. For purposes of the study, if units in a particular state attended at the same time, we treated them as one unit.

Individuals who were present twelve months preceding the NTC/Reforger/Blazing Trails rotation were followed forward to determine whether they were still present in the unit and in the component six months following the rotation and until the end of FY86. For each of the units attending the training exercises, we chose a set of comparable units in the same state and followed individuals in these units in the same manner. We used simple and more sophisticated statistical comparisons of attrition from units attending the exercises and those who did not, to determine the effects of the NTC/Reforger/Blazing Trails exercises and accompanying increased training on attrition.

Several definitions of attrition are used in making these comparisons. The first definition measures individual attrition as those leaving the component, while the second measures attrition as those leaving the unit. The latter definition includes both people who transfer out of the unit as well as people leaving the component. For each of these attrition definitions we have used two time periods. The first measures the level of attrition from one year prior to the date of the exercise until six months after it. The second definition measures attrition from twelve months prior to the date of the exercise till the end of FY86. Almost all the units have an eighteen month history, with the exception of the Louisiana second NTC unit and the Kentucky Army Reserve Blazing Trails unit who went in June of 1986. For the longer time period, we have data on five out of seven NTC units and three out of the six Reforger units. We have between six months to two years of additional history for these units (i.e. beyond the eighteen month period). Because all the Blazing Trails units attended in 1986, we do not have comparable longer-run data on any of these units.

EVIDENCE FROM THE 1986 SURVEY OF RESERVE COMPONENTS

Before presenting the results of the analyses of units actually undergoing the training, however, we thought it might be helpful to place this study in a larger context by examining evidence from a recent 1986 Survey of Reserve Components on the willingness of reservists to provide extra time for training and the effect such a requirement would have on the intentions to reenlist. The survey was also used to compute the current costs and benefits of reserve participation and to show that the real net return from additional time, particularly to junior enlisted personnel, tends to be very small. This evidence offers some useful lessons, that combined with the evidence from our study on the actual effects of longer and more intense training time, provides powerful arguments for the need for changes in reserve compensation and/or other incentives. The major findings from the survey are summarized below.

Reenlistment Intentions: Reservists were asked how likely they would be to reenlist under three different scenarios: the current training schedule, the current schedule plus two extra four-hour drills per month, and the current schedule plus an additional week of annual training. The extended time options reduce the reenlistment rates of junior enlisted personnel by 7 to 13 percentage points and for senior enlisted personnel by 10 to 17 percentage points. Reductions tended to be larger in the Army Guard than the Army Reserve. Reservists were more opposed to the extra drills than the extra annual training. Fulltime workers, not surprisingly, were more adverse to these options than parttime workers, unemployed and students.

Real Return to Reserve Participation: The real return to reserve service is a conceptually broad measure that attempts to take into account the monetary and nonmonetary benefits and costs of reserve participation. Some of the costs (and benefits) cannot be quantified; nonetheless they are significant in the overall decision calculus and need to be considered. Net reserve income is derived from gross reserve income by subtracting taxes, foregone civilian income during annual training (if, for example, employers pay part or no civilian wages during this time), transportation costs, and value of time spent in traveling to drills and annual training. We find that younger enlisted personnel net less than one-half of their gross reserve income and most of the loss comes from transportation and foregone income. Senio officers also net less than half of gross income; here the main reason is taxes. Generally, reservists "take home" between 45 to 60 percent of gross reserve income.

There are other opportunity costs attendant on reserve participation. Survey data indicate that a little less than half of the enlisted personnel and about a quarter of the officers frequently or occasionally lose overtime/extra pay opportunities due to reserve service. In addition, some reservists reported unfavorable attitudes of civilian supervisors towards reserve service and that obtaining time off for annual training caused employer problems

These problems are exarcebated by the conflict that about a quarter of the reservists face with families. Between 10-24 percent of enlisted personnel and 8-15 percent of officers face an unfavorable spouse attitude.

The evidence is persuasive: reservists face real and significant costs when deciding to participate in the reserve. It is not surprising then that increased training time (or expectation thereof) over long periods of time causes high rates of attrition in units selected for such training. The section below summarizes the major findings of our study of the NTC/Reforger/Blazing Trails units.

ATTRITION EFFECTS OF THE NTC/REFORGER/BLAZING TRAILS EXERCISES

Rates of Attrition and Transfer: Overall rates of attrition and transfer are useful in that they summarize in an understandable way the actual experience of the units and groups of individuals within them. However, one must interpret differences between the units attending the NTC/Reforger/Blazing Trails exercises and their comparison units with caution because as shown in the earlier sections, they are not identical in their demographic and experience characteristics. NTC units appear to have an overall unit attrition rate of approximately 30 percent over an eighteen month period; comparison units have a markedly lower attrition rate of 22.6 percent over the same time period. The proportion of transfers is also higher in NTC units. The rate of transfers to other Guard units is 4.5 percent for NTC units compared to 3.0 percent for non-NTC units. However, the difference in unit attrition is mainly due to increased Guard separations as opposed to transfers from the NTC units. Attrition due to separation was almost 23 percent higher in NTC units than the rate for the comparison group, while attrition due to both separation and transfers was 25 percent higher for NTC units. For the Reforger and Blazing Trails samples, the attrition differences are much smaller between the units attending these exercises and their comparison units. For example, overall unit attrition is only 6 percent higher in the Reforger units and only about 3 percent higher in the Blazing Trails units than the respective comparison units. Again, these differences are due primarily to separations, not transfers. Indeed, the comparison units for the Blazing Trails sample have a slightly higher transfer rate than the Blazing Trails units.

The longer-run separation rates represent the average for units with varying lengths of history. However, it is interesting to note that the differences between the NTC and the comparison units continue into the longer time period and the magnitude of these differences is identical to those experienced in the shorter time period. Well over 40 percent of the NTC unit personnel have separated by the end of FY86, on average, about two years after the NTC rotation, as compared to less than a third of the comparison unit personnel. On the other hand, the small difference in overall attrition that we had seen earlier with regard to the Reforger units is almost entirely eliminated over the longer-run time period, although the proportion separating from the component, as opposed to transferring to another unit within the component, is still about 9 percent higher than the comparison unit.

Estimation Results: Overall attrition and transfer rates are useful but they represent the gross effects of all factors combined. If we wish to estimate a net effect that one can attribute to the exercise alone, we need to estimate multivariate models of attrition. Looking at unit attrition in the NTC sample first, we find that the attrition probability is 0.21 over the eighteen month period period for the reference individual, who is an enlisted reservist, nonblack, age less than 40 years, married, high school graduate, Category III with six to eleven years of service and serving in a Guard non-NTC unit. If this individual were black, instead of nonblack, the attrition probability would be significantly lower: 0.17. Statistically significant and large differences occur in attrition rates among lower quality individuals (high school nongraduates, Category IV) and those with fewer than three years of service. These groups all have much higher attrition rates (between 0.30 - 0.43) as compared to 0.21 for our reference individuals. Surprisingly, so do Category I,II recruits. On the other hand, blacks and those with greater experience (with greater than eleven years of service) have significantly lower attrition rates.

From the viewpoint of the study, it is the effect of being in an NTC unit that we are primarily interested in measuring. Holding everything else constant, the attrition probability for our reference individual rises from 0.21 to 0.28 for those serving in NTC units, an increase of almost 33 percent. The difference is statistically significant at a 0.01 level of significance.

Turning now to attrition from the Guard, we find, as expected, that attrition probabilities for all groups are somewhat smaller. Basically the same patterns show up. The probability of attrition is 0.23 for our reference individual in an NTC unit as compared to 0.14 in a non-NTC unit. This difference is significant at a 0.01 level of significance. This represents an increase in attrition of 28 percent.

It is instructive to compare these results with those of the Reforger and Blazing Trails samples. First, the attrition probabilities for the reference individuals (nonblack, enlisted, age less than 40 years, married, high school graduate, Category III with six to eleven years of service, serving in a Guard unit not attending the training exercise), are remarkably similar across the three samples. The effects of other characteristics are also fairly consistent. For example, lower quality individuals and those with fewer than three years of service have significantly higher unit attrition probabilities in both the Reforger and Blazing Trails samples. Blacks also have lower attrition rates, although the effect is not statistically signifcant in the Blazing Trails sample. Officers also have significantly higher attrition probabilities in the Blazing Trails sample, although, as mentioned before, this may be partly due to a poor choice of comparison units for this sample.

There are two important differences that must be noted between these two models and the NTC results. First, unlike the large and significant difference we found between the NTC and the comparison units in terms of attrition probability, we find almost no difference between the Reforger and Blazing Trails units and their comparison units, after controlling for demographic and experience characteristics. In other words, identical

individuals serving in these units versus the comparison units would have very similar attrition rates. Thus, a tentative conclusion that could be drawn from these data alone is that while the NTC experience causes the units to suffer large and significant losses, other things equal, there is little or no difference between those selected for the Reforger and the Blazing Trails exercises and those that are not. Second, because the units attending Reforger and Blazing Trails exercises were from both components, we explicitly tested for differences in attrition between the two components by including a separate dummy variable for the Army Reserve. We find that there appear to be significant differences (between 19-46 percent) between similar individuals in the Army Guard and Army Reserve units, with Army Reserve units having higher attrition probabilities, an effect confirmed by other research.

Among all the groups of reservists in the NTC sample, the one big difference we find consistently is for Category IV individuals who appear to be affected by the NTC experience disproportionately when compared to other groups. In terms of the other groups, the attrition patterns are fairly consistent and plausible, with high school nongraduates and those with less experience tending to leave at considerably higher rates across all units. Those with between 11 and 20 years of service, not unexpectedly, have much lower attrition probabilities; this is, of course, a self-selected group that has consciously chosen to stay because of a taste for military service. In addition, at this point, the vesting in the retirement system acts as a powerful incentive to remain.

Longer-Run Effects: The unit attrition probability of individuals with reference characteristics increases from 0.21 in the short-run to 0.31 in the longer-run; for attrition from the component, the comparable numbers are 0.18 to 0.24. The difference between individuals in NTC units and similar individuals in non-NTC units in terms of attrition probabilities remains the same in the two models when one considers orders of magnitude. For example, NTC units have a 33 percent higher probability of attrition in the short-run; over the longer-run, the difference is 32 percent. For Guard attrition, the relative differences are 28 percent in the short-run and 25 percent in the long-run. This has some serious implications for policymakers when considering implementing increased training requirements without concomitant changes in reserve compensation or the incentive structure. Clearly, the one piece of information that is missing here is the supply side of the picture: if units are successful in recruiting, then the NTC experience may produce a net gain as less desirable individuals are replaced by perhaps higher quality and better motivated individuals who appreciate the higher level of unit readiness achieved through NTC. On the other hand, if units are left scrambling to fill these slots and are operating on a long-term basis with less than full strength, then the higher levels of unit training readiness may well be dissipated because of the lower levels of personnel readiness.

In the Reforger sample, we find that the attrition probability actually is lower for individuals in such units, and although the difference is small, it is statistically significant, at least for unit attrition. Surprisingly, for the unit attrition equation, we find that Army Reserve units tend, in the longer-run, to have lower attrition probabilities, a complete reversal of the effect we found earlier in the short-run model. However, in terms of

component attrition, the two probabilities are identical, suggesting that individuals in Guard units tend to transfer more than their counterparts in the Army Reserve units.

State-Specific Results

The NTC Sample: Despite differences in the profile of units across states, the pattern that emerges from the data is strikingly clear: NTC units have significantly higher unit and Guard attrition than comparison units over the same period, without an exception. The relative differences in unit attrition between the NTC units and the non-NTC units over the eighteen month time period range from 20 percent to over 100 percent in North Carolina. Some of these differences may partly be an artifact of the poor choice of comparison units. Nonetheless, there appears to be substantial evidence to suggest that the NTC experience leads to higher unit and Guard attrition in every case.

Looking at attrition over the longer-run, we find that attrition rates in general tend to be very high: between 40 to 50 percent of personnel who were present one year before the NTC date leave or transfer within (on average) one to three years after NTC.

Turning to the estimation results, we find that, other things equal, membership in the NTC units raises the probability of unit attrition for the reference individual without exception. Attrition probabilities are statistically significant in four out of seven cases and increase unit attrition for a typical individual for NTC units in the range of 20 to 50 percent (except for the second Georgia unit). In the Guard attrition model, the same pattern is repeated: NTC units have generally higher separation rates in all units than comparison units, holding all other factors constant. These results are statistically significant for four of the seven units. The relative difference in attrition rates ranges from 0 percent (Georgia second unit) to 80 percent in North Carolina.

The comparisons between the short-run and the longer-run models are interesting: the difference in unit attrition between the NTC and comparison units widens over time in almost every case. Alabama shows the largest percentage increase between short- and long-run attrition probabilities, from 21.4 percent to 41.7 percent. This is true of Guard attrition as well. However, we find that the difference in Guard attrition between NTC and comparison units appears to narrow over time for three out of the six units, suggesting that individuals in NTC units tend to transfer to other units over time.

The Reforger Sample: Unlike the patterns we saw above for the NTC units, we find no consistent patterns in the attrition experience of the Reforger units versus the comparison units. In some states (Alabama, Massachusetts, South Carolina), the Reforger units do have a higher overall unit attrition rate and most of the difference comes from separations rather than transfers. On the other hand, in the other three states, Reforger units have lower rates, and in the case of Iowa, markedly so. In the longer-run, which again is not

directly comparable because of the uneven lengths of history, the attrition rates rise but again, the pattern is not consistent: the Iowa Reforger unit displays an almost 25 percent lower unit attrition rate than that of the comparison unit while the other two Reforger units (in Massachusetts and South Carolina) show a small (approximately 10 percent) increase in unit attrition.

- In the estimation results, we find that being a member of a unit selected to attend the training exercise (Reforger in this case) does not have any effect on attrition. In no case is the variable significant; in some cases, Reforger units show a decrease in attrition probabilities.

The Blazing Trails Sample: In only one state, Kentucky, do we find a higher attrition rate for the Blazing Trail unit as compared to its comparison unit, and even here, the difference is small. In all other instances, the Blazing Trails units tend to have equal or somewhat lower attrition rates than their counterparts. In three units (Alabama, Georgia, and the Missouri second unit), transfer rates are higher than for comparison units. However, even this pattern is not consistent across all states. Again, in the estimation results, we find little or no difference between the comparison units and those attending the Blazing Trails exercises.

Timing of Attrition

From a policy standpoint, an important question is the timing of attrition from the unit. If the higher rate of attrition experienced by the units selected for more intense types of training, such as NTC in particular, is the result of a conscious, deliberate policy on the part of the units to gear up for NTC by getting rid of marginal performers, then the retention losses may actually improve total unit readiness. However, if individuals are themselves making the decisions to separate because of lost income, lost vacation, or employer/family conflicts, then the high rate of attrition presages problems for the reserve components should such a policy be implemented on a wider basis. In this section, we examine the *timing* of attrition by estimating multivariate models of time-related dependennt variables.

Examining the NTC sample first, we find that attrition seems to be particularly high among lower-quality and less experienced personnel and (somewhat surprisingly) singles. These patterns are evident in the NTC units also where Category IV personnel and high school nongraduates have markedly higher attrition probabilities, lending some credence to the "gearing-up" hypothesis. What is somewhat disturbing is the significantly higher attrition probability of Category I,II personnel also during these periods. Blacks, older and more experienced personnel tend to have lower attrition probabilities in both the non-NTC and NTC units. Officers, however, appear to have very high attrition probabilities of leaving in the late period from non-NTC units. In the NTC units, those with fewer than 6 years of service tend to have significantly higher probabilities of leaving during the late period suggesting that the NTC experience tends to affect them disproportionately.

Apart from the patterns within NTC and non-NTC units, we find that NTC units, even controlling for all other variables, have a higher rate of attrition than non-NTC units. This effect is particularly marked and significant in the middle period; this lends more support to the opposite hypothesis, that individuals knowing some of the costs they are facing because of the increased training time requirements decide to separate from the unit.

In the Reforger sample, we find fairly consistent patterns across time. Category IV personnel, high school nongraduates, and those with fewer than three years of service have considerably higher attrition probabilities in the non-Reforger units. Being in a Reforger unit by itself does not appear to raise the probability of attrition. However, in the Reforger units, those with fewer than three years of service have a very high probability of attrition from the unit during the period immediately preceding the training exercise, again suggesting that these individuals make conscious decisions to leave perhaps because of the costs attendant on going abroad for the Reforger training.

The Blazing Trails results mirror those of the Reforger sample except in a few instances. Here, surprisingly, being in a Blazing Trails unit actually significantly lowers the probability of attrition for reference individuals during the middle period. Also, we find, as with the NTC units in the late period, officers tend to leave during the late period.

We must caveat these results by pointing out that the validity of these comparisons depends to some degree on our assumption that the units we have selected for the comparison sample are similar to those attending the NTC/Reforger/Blazing Trails exercises. While we have controlled for demographic and some service-related variables in the regression models, if the units differ in some unmeasured way, then our estimates of the effects of NTC/Reforger/Blazing Trails are being measured with some unknown degree of error. Even allowing for this, we believe that the results, backed by the evidence gathered from the case-studies point to the fact that the NTC experience does lead to higher attrition and these effects may not be confined to the immediate time period before and after NTC. There appears to be some plausible evidence that the Reforger and Blazing Trails units, on the other hand, do not have the same experience. Their attrition rates appear to be close to, or at least, not markedly different from, other units in the same state not selected to participate in these exercises.

CAUSES OF DIFFERENTIAL ATTRITION EFFECTS

There are four hypothesis for higher levels of unit attrition which arise both from previous research and from the case studies. These are:

- The additional training time required for NTC causes family conflict leading to separation or transfer.

- The additional training time required for NTC causes employer problems leading to transfer or separation.

- The additional training time causes increased loss of income, vacation time or increased threat of job dismissal.

- Tighter physical conditioning, performance or attendance standards are imposed in preparation for NTC leading to transfer or separation of marginal performers.

It is important to distinguish among these reasons for higher attrition levels since they have quite different implications. In the first three cases, reservists may be lost who are performing well, but quit or transfer due to conflicts or losses connected with training. In the latter case primarily marginal performers are lost and the effects on personnel readiness may be positive. In this study we were not able to distinguish what part of the additional attrition might be attributed to each cause. A more comprehensive study using surveys of individual reservists would be required to address this question. However, in the case studies which included interviews with about 150 reservists in the NTC units, we found some evidence to support that each of the hypothesis was operational and causing part of the attrition.

Employer and family conflicts get exacerbated by the additional training time required during the NTC trainup and rotation. These conflicts cannot be easily or neatly characterized, but are as diverse as are the family and employer situations of reservists. Employer problems seem to arise more frequently for individuals working for small employers, or as part of small production teams in larger organizations. These individuals are harder to replace and their absence can cause conflict and resentment from co-workers. Employer problems are often encountered in larger employers who support the Guard from a corporate perspective, but whose first line supervisors still find employee absence a problem.

Family problems arise from ordinary concerns of not spending enough time with spouse and children, as well as more complex concerns of single parents finding child care and of restricted child visitation rights for divorced parents. Family conflicts can also arise from lost income during annual training, use of family vacation time and leave without pay to meet Guard obligations. Most younger Guardsman interviewed experienced loss of income during annual training and/or NTC rotation due to the fact that military pay did not make up for lost civilian income. Many used personal vacation time and leave without pay to attend extra drills and NTC.

The legal protection for Guardsman that entitles them to military leave and protection from discrimination and dismissal for Guard related duty clearly is not a panacea for these problems. Some Guardsman we talked with felt they were at a disadvantage in getting jobs, keeping jobs and in promotion because of Guard duty. Many felt that employers view Guard participation as a negative factor in evaluation. They also realize that employers are smart enough not to explicitly connect Guard duty and job performance and evaluation. In the end the threat of legal sanctions is a distant and cumbersome process, and most Guardsman have to rely on the good will of employers. This is certainly present for a majority of Guardsman, but

remains somewhat problematical for an uncomfortable percentage of Guardsman. If training schedules increase, this good will will be increasingly tested.

Independent of family conflicts, lost income and vacation time can increase tendencies toward attrition. Both Officer and enlisted personnel related concern about lost income during interviews. The problem seems more pronounced for junior enlisted personnel for whom loss of income can have more severe consequences.

Income loss occurred in several ways during NTC trainup for reservists. The most common way was during the three week rotation when military pay did not make up for lost civilian pay. Younger reservists are less protected by more liberal employer policies which pay full or partial civilian pay during annual training periods. Most younger reservists receive no civilian pay during this period, and the NTC rotation not only caused a loss of income, but military pay was later in coming. This caused a troublesome gap in paychecks.

Lost income also resulted when many reservists had to take leave without pay to attend the extra drills and annual training period required during NTC. Some reservists give up lucrative overtime opportunities during this period, and some lost income because bonus payments connected with production quotas was lost because of Friday drills.

For officers, problems seemed to be focused more on those self-employed. Officers are more likely to have liberal employer pay policies, and losses in income and gaps in paychecks may not be as serious. However, several self-employed officers who put in substantial amounts of time in planning saw a deterioration in earnings during this period. For these individuals there is also no effective military leave since they work for themselves.

Appendix

STATE REGRESSION RESULTS WITH INTERACTION TERMS

Table A.1

ATTRITION FROM THE UNIT OVER THE EIGHTEEN MONTH PERIOD: NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit over the eighteen month period						
	Alabama	Georgia (1-121)	Georgia (2-121)	Louisiana (3-156)	Louisiana (2-156)	Minnesota	North Carolina
Reference group[a]	0.11	0.28	0.27	0.19	0.24	0.16	0.13
Black	0.08	0.23	0.22	0.18	0.18*	--[b]	0.10
Officer	0.11	0.14*	0.13**	0.27	0.31	0.22	0.09
Age ≥ 40	0.10	0.18*	0.19	0.13	0.18	0.16	0.11
Single	0.15	0.24	0.29	0.14	0.23	0.15	0.17
High school nongraduate	0.18*	0.26	0.26	0.25*	0.33*	0.43**	0.19
Category I, II	0.11	0.30	0.34	0.27*	0.27	0.15	0.16
Category IV	0.16	0.13*	0.16	0.39**	0.41**	0.23	0.15
0 ≤ YOS < 3	0.64**	0.91**	0.77**	0.28*	0.21	0.75**	0.26*
3 ≤ YOS < 6	0.19	0.22	0.20	0.22	0.27	0.07**	0.17
11 ≤ YOS < 20	0.09	0.14**	0.15**	0.20	0.27	0.08*	0.08*
20 ≤ YOS	0.12	0.18	0.15	0.18	0.22	0.10	0.11
NTC unit	0.19	0.20	0.24	0.34*	0.34	0.22	0.28**
Interaction Terms If in an NTC unit and having the following characteristic:							
Black	0.15	0.10*	0.23	0.36	0.33	--[b]	0.27
Officer	0.17	0.22	0.12	0.27	0.39	0.11*	0.26
Age ≥ 40	0.18	0.21	0.21	0.20	0.24	0.19	0.19
Single	0.30	0.27	0.22	0.34	0.22*	0.18	0.22
High school nongraduate	0.28	0.27	0.25	0.42	0.44	0.51	0.42
Category I, II	0.23	0.19	0.40	0.48	0.34	0.37**	0.32
Category IV	0.33	0.43**	0.45**	0.40	0.36	0.41	0.78**
0 ≤ YOS < 3	0.48*	0.90	0.44*	0.17	0.38	0.73	0.53
3 ≤ YOS < 6	0.20	0.29*	0.21	0.22*	0.34	0.15	0.35
11 ≤ YOS < 20	0.10	0.13	0.11	0.26	0.27	0.09	0.15
20 ≤ YOS	0.11	0.19	0.27	0.45	0.35	0.05	0.21

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table A.2

ATTRITION FROM THE GUARD OVER THE EIGHTEEN MONTH PERIOD: NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit over the eighteen month period						
	Alabama	Georgia (1-121)	Georgia (2-121)	Louisiana (3-156)	Louisiana (2-156)	Minnesota	North Carolina
Reference group[a]	0.07	0.24	0.27	0.22	0.19	0.15	0.11
Black	0.04*	0.20	0.19	0.16	0.15	--[b]	0.08
Officer	0.07	0.14	0.12*	0.28	0.20	0.22	0.09
Age ≥ 40	0.05	0.17	0.18	0.13	0.16	0.16	0.09
Single	0.09	0.16*	0.19	0.16	0.20	0.15	0.16
High school nongraduate	0.12*	0.22	0.20	0.23	0.26*	0.42**	0.17*
Category I, II	0.08	0.25	0.30	0.24	0.18	0.15	0.12
Category IV	0.17*	0.12*	0.15	0.42**	0.36**	0.23	0.13
0 ≤ YOS < 3	0.68**	0.90**	0.76**	0.22*	0.19	0.75**	0.20*
3 ≤ YOS < 6	0.13	0.22	0.20	0.19	0.25	0.07**	0.13
11 ≤ YOS < 20	0.05	0.13**	0.12**	0.19	0.23	0.08*	0.07*
20 ≤ YOS	0.06	0.14	0.11*	0.20	0.15	0.10	0.09
NTC unit	0 10	0.16	0.21	0.26	0.31	0.21	0.19
Interaction Terms If in an NTC unit and having the following characteristic:							
Black	0.07	0.09	0.15	0.27	0.30	--[b]	0.17
Officer	0.07	0.24	0.14	0.19	0.27	0.09*	0.17
Age ≥ 40	0.12	0.18	0.18	0.12	0.23	0.19	0.12
Single	0.17	0.20*	0.19	0.26	0.18**	0.18	0.13*
High school nongraduate	0.11	0.20	0.22	0.31	0.41	0.49	0.28
Category I, II	0.16	0.14	0.28	0.40	0.30	0.37**	0.22
Category IV	0.41	0.41**	0.48**	0.37	0.34	0.41	0.83**
0 ≤ YOS < 3	0.32**	0.84	0.48	0.35	0.40	0.72	0.44
3 ≤ YOS < 6	0.11	0.24	0.19	0.16	0.34	0.14	0.28
11 ≤ YOS < 20	0.05	0.12	0.10	0.23	0.22	0.09	0.10
20 ≤ YOS	0.04	0.13	0.16	0.41	0.34	0.04	0.22

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table A.3

LONG-RUN ATTRITION FROM THE UNIT UNTIL SEPTEMBER 1986: NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit over the eighteen month period						
	Alabama	Georgia (1-121)	Georgia (2-121)	Louisiana (3-156)	Louisiana (2-156)	Minnesota	North Carolina
Reference group[a]	0.26	0.43	0.39	0.28	0.24	0.35	0.20
Black	0.21	0.34*	0.30*	0.25	0.18*	--[b]	0.16
Officer	0.33	0.43	0.37	0.34	0.31	0.71**	0.24
Age ≥ 40	0.24	0.28**	0.28*	0.23	0.18	0.43	0.16
Single	0.34	0.45	0.45	0.24	0.23	0.42	0.22
High school nongraduate	0.31	0.40	0.37	0.40**	0.33*	0.50*	0.25*
Category I, II	0.29	0.48	0.48	0.40*	0.27	0.34	0.24
Category IV	0.36	0.29	0.29	0.52**	0.41**	0.45	0.19
0 ≤ YOS < 3	0.62**	0.88**	0.72**	0.37	0.21	0.81**	0.32*
3 ≤ YOS < 6	0.25	0.41	0.35	0.31	0.27	0.22**	0.24
11 ≤ YOS < 20	0.13**	0.30**	0.26**	0.29	0.27	0.58**	0.10**
20 ≤ YOS	0.20	0.48	0.43	0.27	0.22	0.17*	0.18
NTC unit	0.32	0.39	0.34	0.50**	0.34	0.41	0.33*
Interaction Terms If in an NTC unit and having the following characteristic:							
Black	0.30	0.23	0.35	0.45	0.33	--[b]	0.38
Officer	0.29	0.51	0.31	0.60	0.39	0.52*	0.49
Age ≥ 40	0.28	0.40	0.27	0.24	0.24	0.33	0.24
Single	0.42	0.58**	0.33	0.54	0.22*	0.40	0.26
High school nongraduate	0.40	0.45	0.38	0.61	0.44	0.56	0.49
Category I, II	0.39	0.35	0.51	0.59	0.34	0.52	0.38
Category IV	0.36	0.55**	0.45	0.51*	0.36	0.48	0.74**
0 ≤ YOS < 3	0.65	0.83	0.50	0.50	0.38	0.87	0.60
3 ≤ YOS < 6	0.34	0.54*	0.38	0.36*	0.34	0.47**	0.39
11 ≤ YOS < 20	0.25	0.37	0.21	0.50	0.27	0.69	0.22
20 ≤ YOS	0.30	0.41	0.42	0.74	0.35	0.23	0.33

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.

Table A.4

LONG-RUN ATTRITION FROM THE GUARD UNTIL SEPTEMBER 1986: NTC SAMPLE

Independent Variables	Dependent Variable: Attrition from the unit over the eighteen month period						
	Alabama	Georgia (1-121)	Georgia (2-121)	Louisiana (3-156)	Louisiana (2-156)	Minnesota	North Carolina
Reference group[a]	0.09	0.35	0.32	0.24	0.19	0.27	0.13
Black	0.05	0.29*	0.24*	0.20	0.15	--[b]	0.12
Officer	0.08	0.20	0.17*	0.31	0.20	0.29	0.11
Age ≥ 40	0.07	0.27	0.27	0.24	0.16	0.37	0.11
Single	0.12	0.33	0.33	0.22	0.20	0.27	0.17
High school nongraduate	0.14	0.34	0.30	0.31	0.26	0.48**	0.19
Category I, II	0.14	0.39	0.41*	0.26	0.18	0.28	0.14
Category IV	0.19*	0.20*	0.22	0.49**	0.36**	0.33	0.14
0 ≤ YOS < 3	0.68**	0.85**	0.68**	0.29	0.19	0.83**	0.25*
3 ≤ YOS < 6	0.16	0.35	0.30	0.27	0.25	0.21	0.17
11 ≤ YOS < 20	0.06	0.21**	0.18**	0.23	0.23	0.12**	0.07*
20 ≤ YOS	0.10	0.27	0.23	0.16	0.15	0.14	0.11
NTC unit	0.13	0.28	0.29	0.33	0.31	0.31	0.22
Interaction Terms If in an NTC unit and having the following characteristic:							
Black	0.10	0.19	0.26	0.36	0.30	--[b]	0.22
Officer	0.08	0.32	0.14	0.22	0.27	0.17	0.26
Age ≥ 40	0.13	0.32	0.22	0.19	0.23**	0.28	0.14
Single	0.21	0.39**	0.30	0.36	0.18	0.28	0.15*
High school nongraduate	0.15	0.35	0.35	0.44	0.41	0.51	0.33
Category I, II	0.19	0.22	0.36	0.47	0.30	0.43	0.27
Category IV	0.40	0.49**	0.39	0.37*	0.34	0.48	0.80**
0 ≤ YOS < 3	0.50	0.77	0.50	0.34	0.40	0.83	0.49
3 ≤ YOS < 6	0.17	0.41	0.34	0.22*	0.34	0.36	0.31
11 ≤ YOS < 20	0.06	0.23	0.18	0.23	0.22	0.17	0.12
20 ≤ YOS	0.07	0.17	0.31	0.37	0.34	0.10	0.24

[a]The reference group consists of nonblack, enlisted, age less than 40 years, married, high school graduates, Category III with six to eleven years of service, serving in non-NTC units.

[b]Too small a sample size to be included separately.

*Significant at .05 level.

**Significant at .01 level.